

Annual Report 1983-84



Department of Agriculture
New South Wales

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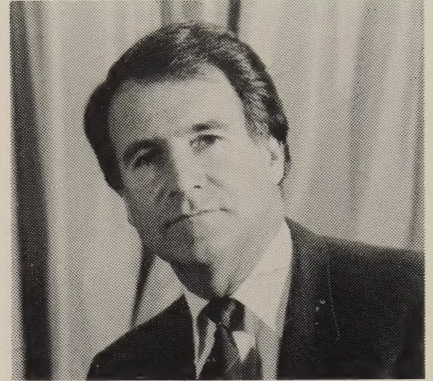
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**REPORT
OF THE
DEPARTMENT OF
AGRICULTURE**
for the
Year ended
30th June 1984

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The Hon. J. R. HALLAM
Minister for Agriculture
and Fisheries
Sydney

Sir,
I have the honour to present a report
reviewing the activities of the
Department of Agriculture for the
year ended 30th June 1984.

G. H. KNOWLES
Director-General



The objectives of the Department of Agriculture New South Wales are to safeguard and improve the productivity of the agricultural and fishing industries of New South Wales; and to encourage the orderly marketing of safe, acceptable produce, with consequent improvement in the prosperity and quality of life of both rural and urban communities.

The main aim of this report is to enable the Minister to table in Parliament a comprehensive record of what the Department did to attain its objectives during the year under review.

This report is also distributed to libraries and others throughout Australia and overseas, usually on an exchange basis. It is not intended for the wider audience catered for by other, more regular, publications. More detailed statistical information on agricultural and fishing industries and commodities is available from the Department and from other sources.

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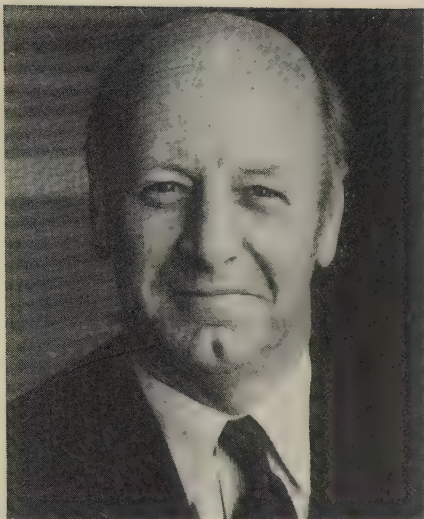
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FOREWORD by the Director-General of Agriculture, Mr G.H. Knowles

Record Harvest

The State's biggest ever wheat crop of 8 500 000 tonnes was harvested after delays due to the wet weather. Weather damage cost farmers around \$100,000,000 in dockages. Stripe rust of wheat appeared in epidemic proportions for the first time, and the Department launched major regionally based advisory campaigns to help producers deal with it.

Barley and oat crops were also records and the gross value of winter cereals in total was over \$1,600,000,000.

Conservation Tillage

A greater proportion of the State's wheat crop was sown using conservation tillage techniques than ever before. The increase was partly due to wider farmer adoption of the practice and partly to the season favouring conservation tillage rather than conventional fallowing and cultivation. The Department's research and advisory effort is based on regional teams that extend the full length of the wheat belt. There is a strong element of producer participation in the programmes and in many instances joint research and advisory projects were undertaken with the Soil Conservation Service.

Research at Tamworth, Wagga Wagga, Cowra and Grafton was examining development of suitable machinery, increased disease incidence, and the risk of soil compaction.

Camden Park Estate

On Australia Day 1984, the State Government announced the purchase of an additional 850 hectares of the original John Macarthur Estate at Camden, together with the flock of Merino sheep descended from Macarthur's. With most of the Estate now under the control of the Government, the Department of Agriculture began restorative work aimed at returning the property to prime condition and at preparing it for continued agricultural research. Site work started for a major agricultural and veterinary research complex to be built on the Estate.

Rangeland Management Research

In recognition of the increasing importance of informed management of the State's semi arid rangeland resources, a rangeland management research and advisory unit was established at Cobar. Two research agronomists experienced in rangeland work were appointed, together with appropriate support staff, and they began the first of several long term research programmes. A veterinary officer to look after both animal health and production was also located at Cobar, and other staff will join them in the future.

Salinity

Poor soil drainage, poor irrigation techniques and long term changes in catchment hydrology have led to critical waterlogging and salinity problems in the Murray and Murrumbidgee Valleys. To strengthen existing research and advisory programmes aimed at ameliorating salinity problems, the Department established a special salinity research unit at Deniliquin. Six specialist officers constitute the unit. One of the research programmes underway at Deniliquin was aimed at finding a quick and easy method of assessing soil salinity. Results were encouraging.

Mouse Plague

Improved conditions associated with the breaking of the drought last year led to a mouse plague which, although not equally severe across the State, was nevertheless extremely serious in many areas. The Department mounted a statewide monitoring programme employing 70 refuge/crop sites and 30 trapsites throughout the grain belt.

A Pesticides Order was issued by the Registrar of Pesticides to permit crop perimeter baiting with bromadiolone and brodifacoum baits.

Pastures Protection Boards in the badly affected areas mixed and supplied baits to ratepayers at cost.

Cattle Tick

The new cattle tick control programme that became operative on 1st July proved highly successful in its first season of operation. The new programme placed responsibility on stockowners for controlling cattle tick on their own properties. A major regional advisory programme helped introduce the new policy. Stockowner response to the recommended programme exceeded all expectations with 85 per cent of stockowners in the old compulsory dipping area participating. Only 11 properties were infested, compared with 25 in the previous year.

Overseas Aid Projects

A programme to develop a model beef cattle farm on Hainan Island, China, concluded. The programme had run for three years and involved two departmental officers and their families living on Hainan Island as well as short visits by senior specialist staff as required. The project achieved its prime aim of establishing 870 ha of sub-tropical pasture on what was previously low quality rough grazing. As a consequence of the pasture establishment, the Department was able to develop and demonstrate Australian pasture and animal management techniques such as the use of sub-division fencing for stock control and the use of stock handling facilities.

The on-farm training of many Chinese technicians was a significant segment of the Department's overall contribution to the development of the beef cattle farm. Both Chinese and Australian officials considered the project an outstanding success.

The Department is managing phase 2 of a land settlement project in Sri Lanka on behalf of the Australian Development Assistance Bureau. Development costs over four years were estimated at \$3,000,000 of which \$1,900,000 had been spent since work commenced in 1980.

Short term assignments were undertaken by 20 senior departmental specialists and totalled 72 weeks in duration. Short term assignments were made to Bhutan, Sri Lanka, China, Morocco, Philippines, Malaysia, Burma, and Papua New Guinea.

Marketing of Primary Products Act

A new Marketing of Primary Products Act, 1983 replaced the old Act of 1927. The new Act contains provisions for greater accountability and for greater flexibility of marketing boards' commercial operations. The legislation will also permit producers of commodities not under the control of a board to use a new form of regulated marketing called Marketing Orders, if they so wish. Operation of the new Act is the responsibility of the newly appointed Director of Marketing.

Asian Trade Mission

The Director-General was a member of a New South Wales Government Trade Mission to Malaysia. As well as Malaysia, he visited Singapore and Brunei. He met with traders, importers and consumers of New South Wales primary products and investigated opportunities for increasing New South Wales exports, particularly fresh fruit and vegetables.

Fisheries Research Institute, Cronulla

In March, the Prime Minister announced the transfer of the CSIRO fisheries and oceanography facilities at Cronulla to the State for the establishment of a Fisheries Research Institute. Work was well in hand to restore and renovate the facilities prior to occupation by departmental staff.

Dairy Industries Act

The Dairy Industry Conference and the Dairy Corporation were established under the Dairy Industries Act. Responsibility for the regulation of on-farm production of milk was transferred from the Department of Agriculture to the Corporation and consequently some staff have transferred from the Department to the Corporation.

Scientific Collections

The Agricultural Scientific Collections Trust Act gives statutory protection to the Biology Branch Herbarium and the Entomology Branch Insect and Mite Collection. The Biology Branch Herbarium is the single most important scientific resource of its kind in Australia. The Entomology Branch collection is the most comprehensive agricultural insect and mite collection in Australia.

The Department's agricultural insect and mite collection, the most comprehensive in Australia, came under the protection of a new Act.



Community Employment Programmes

The Community Employment Programme is funded 70 per cent by the Commonwealth Government and 30 per cent by the State. The Department employed 729 people in 70 different projects at a total cost of over \$9,000,000. Projects included development of the historic Camden Park Estate and renovations to the Fisheries Research Institute at Cronulla. Another employment scheme in which the Department is participating is the Youth Employment Scheme, a State funded programme under which the Department employed 192 young people.

For people employed under both schemes, the Department provided satisfying and instructive work for the temporary employees and made available training opportunities wherever possible.

Stripe Rust

The fungus attacked wheat crops at North Star in July, and the Department immediately issued a Pesticide Order for a lower application rate of the only fungicide then available, and published an information sheet on control of the disease.

Stripe rust spread rapidly, and by mid September it was found throughout the State's wheat areas.

Helped by plant pathologists and senior staff, district agronomists used meetings, field days and the mass media to inform farmers about disease identification, and on whether or not to spray.

The Department initiated a meeting of the four eastern States to share collected information on the epidemic and to discuss problems. As a result, a new stripe rust information sheet was prepared for the 1985 season.

Guayule Research

Professor J. Wayne Whitworth, Professor of Agronomy at New Mexico State University, worked at Condobolin Agricultural Research and Advisory Research Station while on sabbatical leave from May 1983 to April 1984 on dryland guayule establishment and weed control.

Professor Whitworth is an acknowledged authority on guayule, and prior to coming to Australia on sabbatical leave, undertook research in weed control and physiology and into guayule over the period 1962 to 1983. He was also a guayule weed specialist with the U.S. Department of Agriculture in 1951 and 1952. Professor Whitworth was President of the U.S. Western Society of Weed Science, and of the Guayule Rubber Society in 1981-82.

During sabbatical leave he developed an effective weed control programme for guayule establishment, and with Mr P.L. Milthorpe of this Department demonstrated that transplanting of guayule can be made under prescribed dryland conditions. He also contributed substantially to evaluating the available guayule cultivars in Australia as a result of his knowledge and experience in guayule. His contribution to the plant's research advanced the transplanting and weed control portions of the guayule programme by the equivalent of three seasons in one.

Agriculture and Fisheries in 1983-84





WHEAT

Production and Trends

The wheat crop set new records for total production and yield, and equalled the 1968 record area sown. Four million hectares of wheat produced 8 500 000 tonnes of wheat with an average yield of 2.12 tonnes per hectare.

However, a number of problems made the season much less favourable than the statistics suggest. The eastern Australian wheat crop suffered its most serious epidemic of stripe rust since the disease first appeared in Australia in 1979. Yellow leaf spot caused heavy losses, and rain at harvest damaged the crop significantly.

A new wheat marketing Act, to take effect from the 1984-85 harvest, was being negotiated by the wheat industry and the Commonwealth Government. It was expected that like its predecessors, the new Act will cushion growers against drastic price falls on overseas markets.

Diseases

Stripe rust was reported almost simultaneously in mid-July at both Horsham in Victoria and North Star in New South Wales. It soon spread over much of the north-west where it severely damaged early sown crops, most of which were the varieties Harrier and Shortim. The disease moved south, and by September the southern third of the wheat belt was severely affected, reaching a peak in October. Yields were not reduced as much as had been feared because the cool, moist finish to the season allowed even severely defoliated crops to fill their grain. At least 500 000

hectares of crop were sprayed with either Bayleton® or Tilt® to control the disease. Spraying costs exceeded \$10,000,000, and yield losses were estimated at \$30-40,000,000 in a total crop valued at \$1,300,000,000.

Rain Damage

While heavy rain in winter produced waterlogging problems and reduced yield in the north of the State, normally marginal country on the western edge of the wheat belt produced excellent crops.

Heavy and persistent rain throughout the wheat belt at harvest resulted in at least 3 700 000 tonnes of wheat being downgraded. The total cost to the State's wheat growers was probably \$90-110,000,000.

The Prime Wheat Association undertook a pilot programme using "falling number" machines to determine the extent of weather damage at silos where prime hard wheat is received. This resulted in large quantities of wheat that might have gone into the GP weather damaged grade being correctly received into the Northern Hard number 2 grade with a benefit of about \$20 per tonne to growers.

New Varieties

Three new wheat varieties were released during the year. Osprey and Quarrion, bred at Temora Research and Advisory Station, are bearded, early maturing winter wheats. They can be sown from about 20th April, but escape frost damage because they have a cold requirement and do not stem up and head prematurely. Despite their slow growth, they mature at about the same time as spring varieties such as Banks and Condor.

Takari, selected at Tamworth Agricultural Research Centre, is an awnless, early maturing, hard grained variety acceptable for Northern Hard grade. It is resistant to both stem and stripe rusts, and has useful tolerance to frost damage and pre-harvest grain sprouting. The Department spent \$1,000,000 on wheat breeding and varietal improvement in addition to industry-funded research.

Receivals

The Grain Handling Authority had received 8 020 000 tonnes of wheat as at 23rd June 1984. A further

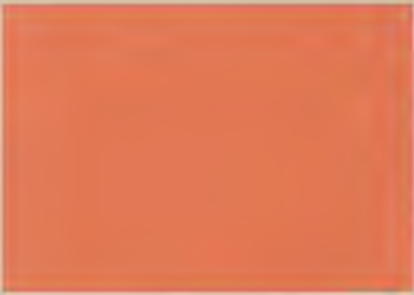
500 000 tonnes were sent to either Victoria or Queensland, or were retained on-farm for seed or stock feeding.

Remote Sensing

The remote sensing section developed methods using visual interpretation of photographic images to estimate the area under winter cereals in the marginal wheatbelt. The methods were ready to be used in advanced trials in 1984.

Soil Treatments

Continuous irrigated cropping on grey cracking clays in central western New South Wales resulted in declining yields in recent years. Investigations showed structural degradation of the subsoil to be an important contributing factor. A field experiment was initiated in 1981 to assess the ability of various deep tillage treatments and gypsum application to improve subsoil conditions and increase yields. Deep ripping to 70 cm depth was the most successful treatment, and the cost of treatment was more than covered by the value of increased yields of one cotton and one wheat crop. Gypsum application also increased yields, but so far not economically.



OTHER CEREALS

Production and Trends

All cereal crops except rice experienced very favourable seasons, and there were record or near record levels of production.

The area sown to barley will probably increase in 1984. Growers were encouraged by the Barley Marketing Board's successful disposal of receivals for the 1983-84 harvest, at least for the short term.

The 1984 oat sowings fell, because of high on-farm stocks of oat grain and low prices, to less than half of 1983 sowings. The record harvest in 1983-84 enabled farmers

to replenish their storages depleted by the drought, and plentiful growth of pastures reduced the need for grazing oats.

Farmers were encouraged to increase lupin sowings by the knowledge that lupins can improve the physical structure of soils, add to reserves of nitrogen and because lupins have good export prospects.

High yields of triticale in 1983-84, because of the favourable spring, led to an increased area in 1984.

Oats

The breaking of the drought stimulated record sowings of oats for stock feed. Just over 1 000 000 hectares of oats were sown, almost all in March and April 1983. The season became so favourable that many farmers did not have sufficient stock to utilise their regenerated pastures and oat crops.

Consequently, many oat crops became rank and produced less grain. Nevertheless, the production of oat grain was estimated at 1 060 000 tonnes, far above the previous record of 820 000 tonnes set in 1981.

Barley

The 585 000 hectares of barley produced a record 1 100 000 tonnes of grain, most of which escaped rain damage.

Triticale

Production of triticale was rapidly expanding, and 160 000 tonnes were produced from 89 000 hectares.

Sorghum

The wet summer in the north favoured the sorghum crop, most of which was dryland sown. Only 185 000 hectares were sown, but production was estimated at 487 000 tonnes.

Maize

Most of the 9000 hectare maize crop was grown in inland areas under irrigation, producing 58 000 tonnes and resulting in a record yield of 6.44 tonnes per hectare. The summer rains greatly benefited unirrigated coastal crops.

Rice

More than 90 per cent of Australia's rice was produced in the Murray & Riverina Region of New South Wales.

The 1983-84 rice crop experienced one of the most unfavourable seasons for many years. Wet weather delayed sowing and encouraged prolific weed growth, and cold weather caused high levels of infertility. Some late sown crops were not worth harvesting, and others had yields far below average. The harvest was much later than normal, only starting in early April. Total production was estimated at 619 000 tonnes from an area of 118 000 hectares and yielded 5.2 tonnes per hectare, the lowest for at least 10 years due to the subnormal season.

Notable research developments included maintenance of rice yield levels when rice is not permanently flooded until two or four weeks prior to panicle initiation compared to conventional early flooding. This development was potentially a substantial financial and water saving to the industry. Other rice establishment research was providing better bloodworm and early weed control information.

The industry assessed the Department's newly released rice variety, M7, under most adverse seasonal conditions, and it

outperformed the standard Calrose variety. Even better crossbreds were being developed.

A procedure was developed to monitor total rice area using 80 m resolution Landsat Multispectral Scanner data. More than 95 per cent accurate, the procedure cost one third of the existing method based on aerial photography. Moves are underway to extend the procedure to cover the whole Murrumbidgee Irrigation Area as a semi-operational programme for the 1984-85 season. The Remote Sensing Section submitted a proposal to evaluate the programme's improved accuracies using 20 m resolution data from the new French SPOT satellite.

Pests

It was one of the worst seasons ever for sorghum midge particularly for late sown crops around Moree and Narrabri, but the pest only reached serious proportions south of Gunnedah late in the season.

Diseases

Crown and leaf rusts of oats were widespread, and caused substantial losses in some crops. Powdery mildew was especially bad in barley, and it extended into southern areas in 1983. Scald and net blotch were wide spread in barley crops,

Triticale production continued to increase.



particularly in the south. Stem rust caused heavy losses in susceptible varieties of triticale in the north. Coorong and Dua are now very susceptible to wheat stem rust and should not be grown.

Boil smut was only a minor problem on coastal maize crops, apparently because it is most damaging when crops are moisture stressed. It was not found west of the ranges or south of Taree.

OTHER FIELD CROPS

Production and Trends

Very wet autumn-winter conditions delayed summer crop harvests, caused product deterioration, and restricted winter crop sowing. High spring rainfalls and associated below-average temperatures delayed summer sowings and ripening of winter crops, and favoured disease. Below-average summer temperatures also retarded growth and maturation of summer crops, especially cotton, soybeans and sunflowers.

The areas for the important non-cereal field crops were:

	Hectares	
	Sown	Harvested
Cotton	97 000	92 700
Linseed	1 240	1 060
Rapeseed	13 000	12 700
Safflower	44 000	35 660
Soybean	24 200	24 000
Sunflower	78 500	60 500
Tobacco	414	409
Lupins	45 000	35 000

Cotton

Cotton plantings were increased substantially because of refilled irrigation storages and, in the case of raingrown crops, good subsoil moisture. Of the total area, 7300 hectares were raingrown. Throughout inland New South Wales the summer season was one of the coolest recorded. The wet and cool season delayed sowings, retarded crop growth and development, and

delayed the maturation of seed cotton. Below-average yields resulted, often with impaired fibre quality. Production was expected to be 440 000 bales of raw cotton, valued with seed at about \$220,000,000.

As a result of the development in early 1983 of resistance in *Heliothis armiger* to the synthetic pyrethroid insecticides, a cooperative strategy was organised to limit their use (see *Foreword*).

Insect pest control using the SIRATAC management system expanded to become widely used in the major New South Wales cotton growing districts. The system was tested by unusually severe tipworm infestation early in the season, and the effects of the cool season on crop development.

Studies on the structural deterioration of cracking clay soils in the Namoi Valley, with emphasis on land preparation at various moisture states, indicated that optimum growth conditions are achieved with land prepared under dry conditions (permanent wilting point). The preparation of land under intermediate moisture conditions may be as damaging as working wet soil because reduced oxygen diffusion and structural massiveness in the soil can result in rough seed beds.

Safflower

The area sown increased eightfold to 44 000 hectares following the wet autumn/winter in the north central and north-west plain, and opportunity cropping of previously flooded lakebeds along the Darling River. However, 20 per cent of the area was not harvested and yields were disappointing because of Rutherglen bug attack, the disease *Alternaria carthami*, rootrots and wet weather damage. Production was estimated at 19 000 tonnes.

Rapeseed

Sowings more than doubled to 13 000 hectares as a result of the good rain. Prospects were excellent in early spring, but continuing wet and humid conditions encouraged heavy infections of alternaria leaf and pod disease, which reduced yield by at least 25 per cent.



Soybean

The replenishment of irrigation storages resulted in an expansion in the soybean area from 14 200 hectares in the previous season to 24 200. Once again, the cool often humid season encouraged the soybean diseases, rust and pod and stem blight, which reduced yield substantially in north coast areas. The new varieties Chaffey, Lawry and Ridley gained wide acceptance in south-western irrigation districts. Their immediate future seems assured in view of ricegrowers' search for alternative enterprises and the construction of a plant at Hanwood to produce full-fat soybean meal.

A previously undescribed fungus disease of soybean, black leaf blight, infected crops in the Manning and North Coast districts, causing estimated losses of up to 50 per cent in individual crops. The fungus causing the disease is seed borne and can survive in infected crop trash. Under experimental conditions, it was shown to infect a number of naturalised legumes growing on the north coast. Work is proceeding on the identification of the fungus and on the possible control of the disease by the use of fungicides.

Sunflowers

Sunflower sowings of 78 500 hectares were the largest for nine years. An estimated 23 000 hectares were sown in lakebed country along the Darling River, but 13 per cent was abandoned because of renewed flooding.

Contrary to the normal pattern, early sowings yielded well and produced a higher yield and quality of oil because of the cool, wet spring and early summer weather. Later sowings were damaged by floods,

retarded by the very cool summer and autumn weather; and very late sown crops were damaged by frost. Sunflower rust (including a new race on previously resistant hybrids), mice and birds all contributed to the abandonment of 23 per cent of the sown area and substantial production losses.

Tobacco

In contrast to the recent dry years, yield and quality of leaf in the State's major northern growing areas improved markedly. The number of quota holders and sharefarmers in the industry continued to decrease and some quotas were sold to tobacco farmers in Queensland.

Grain Legumes

The lupin crop was most successful, producing a record 47 000 tonnes from a record 35 000 hectares. More would have been sown but for a shortage of *Rhizobium* inoculum. For the first time in years, sowing rains came in April, which allowed farmers to sow their lupin crops at the optimum time.

The crop was also favoured by the cool moist finish to the season. Brown leaf spot was a major problem, particularly in the southern third of the State.

Field peas experienced a minor boom, with 5800 hectares sown, and an estimated 8000 tonnes produced.

The season favoured summer grain legumes, as most are grown on dryland, with increased areas sown to cowpeas and mung-beans.

Chickpeas, fababeans and adzuki beans remained very minor crops, but there is increasing interest in chickpeas as a winter grain legume crop.

Sugar Cane

The dry summer preceding the 1983-84 harvest undoubtedly affected cane growth, as sugar production was 159 000 tonnes, down from the 211 000 tonnes produced in 1982-83.

Jojoba

The Minister urged that potential investors exercise care in considering investment in this infant industry, which covers only 650 hectares in the State, and has yet to produce.

Aloe Vera

Correctly named *Aloe barbadensis*, this species has been promoted as aloe vera and is also known as Barbados or Curacaoe aloe and Indian or Jaffarabad aloe.

A number of bodies promoted aloe vera as a new enterprise for pharmaceutical and health purposes in northern New South Wales and Queensland. It was previously grown in the Mediterranean, India and the Central American region to produce a powder used as a pharmaceutical, and the sap used as a healing agent for cuts. Current use claims are for a gel formulation of the sap for treatment of both internal and external medical problems. It is commonly listed on cosmetic product labels.

Guayule

With the breaking of the drought, raingrown and irrigated sections of the cooperative Department of Agriculture-CSIRO guayule research project were established. The Queensland Department of Primary Industries is also involved in this project, which is examining guayule cultivars and populations under irrigated and raingrown conditions near Hillston and at Kingaroy. It will provide detailed information on guayule behaviour and performance over five years as a means of defining the commercial possibilities of the crops in the Hillston area. The

Sunflower sowings were the biggest for nine years.



data from the two sites and phytotron experiments in Canberra should enable some prediction of guayule prospects elsewhere.

Professor J. Wayne Whitworth of New Mexico State University undertook weed research in guayule at the Agricultural Research and Advisory Station, Condobolin. He also contributed significantly to the agronomic and seed production research programme.

PASTURES

Trends in the Industry

There was continued interest in re-establishing pastures, although the cautious attitude which prevented large increases in areas will continue until stock numbers increase. Sown grasses and legumes occupied about

5 500 000 hectares; lucerne about 165 000 hectares, and native pastures about 13 000 000 hectares — a total increase over 1982-83 of about 10 per cent. The use of direct drill, aerial and cover crop establishment techniques increased in popularity. Weeds continued to be a major problem and the use of herbicides in conjunction with grazing strategies were becoming common practice.

High rainfall, mild summer temperatures and low numbers of grazing animals contributed to abundant pasture production.

Good rain was recorded in most districts during spring. The highest recordings were on the north coast, and the lowest in the Hunter River Valley. Legumes grew extremely well in all areas. White clover growth was excellent along the coast and the production of ball clover was outstanding on the tablelands. Recovery of perennial ryegrass and phalaris after the drought was a feature on the southern tablelands. Subterranean clover recovered better than was expected from measurements of available seed. The clover growth extended into late spring because of the temperatures. There was a dramatic increase in production from Persian clover in the irrigation districts of southern New South Wales.

Farmers made every effort to conserve the excessive spring flush. Round bales of pasture hay were common, and there was increased interest in making silage. The wet spring conditions made fodder conservation difficult and much of the conserved hay was weather damaged.

Pasture Problems

The increase in weeds in pastures caused problems in all districts and pasture renovation and weed control required extra attention.

Direct drilling and surface sowing of pastures were particularly successful and farmers now recognise them as the most economical way of establishing pastures.

Soil acidity was increasingly important, but use of lime to ameliorate the problem for pastures was very expensive and difficult to incorporate in non arable situations. About 7 000 000 hectares of land were affected by soil acidity in New South Wales and the area was increasing.



Subterranean Clover

The harvest of subterranean clover seed was delayed due to wet summer conditions. This created delays in the supply of seed for early pasture establishment; the newly released variety, Dalkeith, was particularly affected.

A high level of hard seededness enhances subterranean clover persistence in the variable Australian environment. Newly selected lines which incorporate hardseededness are likely to be superior to Woogenellup in areas with an annual rainfall of 500 mm or less.

Lucerne

A large number of commercially developed lucerne varieties are available which have a combination of multiple aphid resistance and resistance to major diseases such as root and crown rot. Two further varieties, Trifecta and Sequel, should be commercially available in 1985.

Medics

There are still no commercially available aphid resistant barrel medics, but this problem will be overcome when commercial quantities of seed of the varieties Sephi and Paraggio become available.

Research

A strong fertilizer residual retention effect for superphosphate on native grass/white clover pastures was demonstrated for sandstone derived soils. This is similar to the effect previously reported for shale derived soils.

Other research projects further increased knowledge about the effects of lime on various soils in reducing acidity, decreasing aluminium toxicity effects, and increasing the uptake of other nutrients such as phosphorous.



CITRUS

Production and Trends

The production of 212 343 tonnes was 4 per cent less than the previous crop, and well below the record 1980-81 crop of 249 966 tonnes. Although mild conditions followed the breaking of the drought, its delayed effects still reduced crops. The strong demand by processors continued, particularly for Valencia oranges. The supply of lemons was reduced, while the production of mandarins and grapefruit remained unchanged.

The Fruit Industry Sugar Concession Committee increased the minimum country factory prices of Valencia oranges by \$9.00, to \$120.00 per tonne, but average prices paid were higher. Lemon prices increased by \$2.00, to \$97.00, which restored prices to 1981-82 levels. Following the disbanding of the Fruit Industry Sugar Concession Committee, a new Citrus Minimum Pricing Committee was formed by the Australian Citrus Industry Council to determine future prices for citrus fruit delivered to processors after the 1984-85 season.

Plantings continued to expand, with a State increase of 250 hectares to 12 804 hectares, mainly in the Murrumbidgee Irrigation Areas where canning stone fruit trees were removed.

Propagation

A new record of 642 015 citrus buds, an increase of 30 per cent on the previous season, were supplied by the Department to the New South Wales Horticultural Propagation Co-operative Society for distribution to nurserymen. Ninety per cent of buds were from virus tested trees.

Mechanical Harvesting

The development of an air blast harvesting system with the potential to rapidly harvest processing Valencia oranges continued. Field evaluation carried out at Yanco Agricultural Institute over the last two seasons demonstrated the potential of the air harvester and fruit retrieval system. About 80 per cent fruit recovery with less than 5 per cent field wastage under commercial orchard conditions was achieved. The success of the air blast harvesting system depends on effective chemical fruit loosening, which requires further work to ensure consistent results.

The importation of a citrus windrower and pick-up machinery from the United States was made possible by industry support.

POME FRUITS

Production and Trends

The trend toward more efficient, higher density apple plantings continued, with the non-bearing component having 74 per cent more trees planted per hectare than the bearing component. There was little interest in planting pears. Non-bearing trees made up only 9 per cent of total pear trees while 22 per cent of apples were non-bearing.

Trees generally made a good recovery after the drought. Final estimated production was 83 000 tonnes of apples and 12 000 tonnes of pears (87 000 and 10 000 tonnes were produced in 1982-83). However, fruit quality was far superior, and it was expected that the 1984 harvested crop will have better keeping quality in cool storage. A large amount of fruit was damaged by hail at Batlow.

Delicious, mainly red strains, continued to be planted more than any other variety and now makes up 43 per cent of bearing apple trees.

The Department's improved propagation material was again distributed by the NSW Horticultural Propagation Co-operative Society. There were few grafting scions early in the year because of the drought, but a large number of buds were distributed in the autumn.

The use of introduced predators for biological control of pest mites gained further acceptance by apple growers. The predatory mite, *Typhlodromus pyri*, was released into commercial orchards to counter the increasing problem of European red mite, while the well established *T. occidentalis* resulted in reduced pesticide use.

Postharvest rot control was again a major problem, especially in pears.

Consumer research on apple quality continued and a discussion paper was being prepared for industry comment on regulatory market control of new season apples and apples after cool storage.

The wine grape production of 131 000 tonnes was more than 10 per cent greater than the 1982-83 drought-affected vintage.

GRAPES

Production and Trends

A fair demand for most wine grape varieties is expected in 1985, and an expansion in processing facilities in the Buronga area to more than double the tonnage should see a greater utilisation of Sultanas and a keen demand for Gordos. Overseas markets for dried Sultanas could still be depressed, but the prospects for Currants remain good while production of Lexias (Gordos and Waltham Cross) will probably be less than domestic requirements.

The State's wine grape production was estimated at 131 000 tonnes, exceeding the previous year's drought-affected vintage by about 14 000 tonnes. Vintage increased from 12 800 to 22 000 tonnes in the Hunter Valley and from 400 to 1 500 in the Mudgee area. In the irrigation areas, crops were about average and fruit generally in good demand for



winemaking, especially on the MIA where wineries introduced 7800 tonnes from the Murray River to relieve a shortfall in white varieties, with a keen demand for Gordo and Waltham Cross. The total tonnage crushed on the MIA was 89 082.

About 11 800 dry tonnes of dried vine fruits were produced, slightly less than the 1983 crop. A reduced Currant harvest of low quality followed wet weather damage. High quality Sultanas were produced, with a large proportion harvested and dried during good weather conditions. The golden colour of early deliveries helped in the disposal of the crop in a season of world over supply. Some rain in the latter part of harvest darkened fruit.

The area of grapevines decreased slightly for the third year in a row to 14 636 hectares. The decrease reflected continual removals of unwanted varieties on the MIA.

A new Semillon clone, DA 16162, originally selected from the Hunter Valley, was being multiplied for release to industry. It showed a 20 per cent increase in yield over Clone 27, the previous top yielder, in seven years of evaluation of Semillon selections.

The Department helped form an industry based NSW Vine Improvement Committee and regional committees to supply and improve the quality of propagating material.

STONE AND BERRY FRUITS

Cherries

The 1983-84 season was in complete contrast to the previous year when drought seriously reduced crops and resulted in the loss of 340 hectares (28 per cent) of cherry trees in the Young district. Continued wet weather during November and

December 1983 disrupted harvesting and caused extensive fruit cracking and brown rot. Despite these problems, fruit size and quality were excellent and prices were the highest on record. The total crop of 2600 tonnes was 10 per cent greater than the previous one.

Dessert Stone Fruits

The dessert peach crop of 13 300 tonnes was only 5 per cent below the 1982-83 crop, while the nectarine crop of 1600 tonnes was 9 per cent less than the previous one. Frost and hail damaged crops in the central-west, but excellent crops harvested on the coast sold at very favourable prices. Fruit size was extremely good throughout the season, although the extended wet conditions contributed to poor flavour. The area planted to peaches and nectarines was expected to increase.

The dessert apricot crop of 1160 tonnes was the best for several seasons and realised excellent prices.

Canning Stone Fruits

The canning apricot crop was 2600 tonnes, 22 per cent higher than the previous year. Pit burn, a physiological condition which is apparently more common when harvest time is hot and windy, seriously reduced crops and resulted in downgrading of a high proportion of fruits to non-canning grade.

One of the smallest canning peach crops on record was harvested in the MIA producing 6500 tonnes, 32 per cent below the previous year. Production of canning peaches was well below the viable cannery intake requirements for Letona, and Golden Circle in Queensland could not be adequately supplied. Growing conditions were good, but brown rot caused losses.

Despite improved prices and inducement from Letona to plant peaches, growers continued to remove plantings. The area declined to only 505 hectares, from 1318 hectares in 1973.

Plums and Prunes

Japanese and European plum crops of 5700 tonnes and 1500 tonnes respectively, exceeded the 1982-83 crop by 33 per cent. Fruit size was excellent and prices high.

The initial prospects for prunes at Young and in the MIA, the best for many years, were not realised

because wet weather during January and February contributed to reduced sugar levels. A significant amount of the crop at Young was unsuitable for dehydration, and some was sold for jam manufacture. The crop of 1465 dry tonnes for the MIA and 385 for Young was only 60 per cent of the 1982-83 crop.

Low sugar levels in the dried product caused serious storage problems, which necessitated re-sorting. Pests of stored products were troublesome in the MIA. Prune plantings were expected to decline further.

Kiwifruit

The size and quality of the kiwifruit crop was better than in the previous season. Increased quantities of fruit were exported, mainly to Europe, the USA and the Pacific Islands.

Strawberries

Strawberry plantings declined, partly due to a shortage of planting material.

Blueberries

Plantings of blueberries expanded in coastal districts and also near Tumbarumba on the southern tablelands.

TROPICAL FRUIT

Production and Trends

Production of bananas remained relatively static, but increased supplies are expected from Queensland.

An overall increase in plantings for all tropical fruit except bananas is anticipated. The increase will be least in avocados because of the looming over production.

A large range of lesser known tropical fruit is being planted, but the extent of this development is not expected to be great.

Bananas

New South Wales produced 66 700 tonnes of bananas from 6850 hectares (Queensland 50 500 tonnes). Although production in both of the major producing States fluctuates annually, the trend is to greatly increased supplies from Queensland.

Growers are realising the need to produce winter rather than summer bananas, to better compete with increasing Queensland supplies. The main method used was to dig out old areas and replant in October-November.

Research continued into crop regulation by sucker selection and plant defoliation, and into crop forecasting methods. Tissue culture promised significant benefits to the banana industry, but trials revealed unacceptable levels of mutation. Departmental research continued to evaluate the many variants and determine whether any are superior to the existing Williams variety.

The banana industry in the northern districts around Lismore, Mullumbimby and Murwillumbah suffered severe losses through strong winds and torrential rain in April. On the Tweed, virtually all banana plantations were affected, with 35-40 per cent of all banana stools blown

More than a third of Tweed area banana plants were blown down by strong winds in April 1984.



down. Plantations will be out of production for 12 months, at an estimated loss of \$2,000,000 to \$2,500,000. Damage in the Brunswick River district was less, estimated at about 30 per cent of total production, or \$1,000,000. The coastal strip on the Richmond only lost about 25 per cent, or \$500,000.

Ministerial Orders under the Plant Diseases Act were being amended to allow weeds and vegetation up to 30 cm in height to be grown between banana plants. The Orders previously required growers to keep plantations free of weeds to assist detection of bunchy top disease and banana weevil borer. The change is designed to reduce erosion in newly planted bananas.

The Banana Growers Federation exported a trial shipment of bananas to New Zealand in August and intended to send further consignments in the hope of establishing a regular market.

Custard Apples

Production of custard apples rose sharply, and will continue to do so over the next five years. Internal fruit browning caused problems, and the Department was investigating.

Lychee

Lychee production increased for the second consecutive year and the industry made trial shipments to Papua New Guinea and Singapore. Prospects were excellent for export to the northern hemisphere in its off season.

Macadamia

About 800 tonnes of nuts were harvested this year, with exports to Asia, Europe, New Zealand and Canada. As production increases, a greater reliance will be placed on export, and only 20 per cent will be consumed within Australia.

As more of the State's 2500 hectares of macadamias reached bearing age, greater emphasis was placed on mechanical harvesting. American harvesters proved cumbersome on the steeper slopes of northern orchards, but two small pecan units recently imported from the USA were cheaper and more manoeuvrable.

Avocados

Avocado fruit prices were very low on all markets due to increasing production, which is expected to rise sharply in the next few years. While the industry realised the need to promote their product, growers voted at their Annual General Meeting to wait at least 12 months before proceeding with Orders under the Marketing of Primary Products Act to collect levies.

Pests

Swarms of flying foxes (fruit bats) wreaked havoc on tropical and subtropical fruit orchards in northern New South Wales, causing damage estimated at more than \$100,000 in the Richmond district alone.



Production and Trends

Interstate competition in the market continued to depress prices during the year.

Hybrid varieties of vegetables such as cucumber, cauliflower, broccoli, pumpkin, rockmelon, capsicum, eggplant, and Brussels sprouts, increased in number and were more generally used by farmers.

A wet winter in the MIA caused a 20 per cent loss of rockmelons and a 40 per cent reduction in onion plantings. The early cauliflower crops at Bathurst suffered losses, and some potato crops were damaged by saturated soil conditions. Ground preparation and sowing of summer processing vegetables, particularly tomatoes, was also delayed. In the far north coast, heavy rain and wind interrupted cucurbit and tomato production schedules, causing the industry to be without marketable produce for long periods.

Interstate supplies of fresh market tomatoes and lettuce kept prices

severely depressed in Sydney wholesale markets for the whole season. By contrast, the Riverina winter potato crop received record prices in 1983, but by autumn 1984, gross on-farm prices had fallen to below the cost of production.

Broccoli, packed in polystyrene boxes and "top iced", continued to receive improved prices on local and export markets.

The Department spent more than \$1,250,000 on vegetable industry research.

Potatoes

The Department of Agriculture assumed responsibility for potato seed certification on 1st October 1983, and 100 hectares were inspected for the season. Bacterial wilt was detected on a number of properties growing potatoes in the Riverina. The severity of this disease and its widespread incidence could limit this area's production in future years.

Mushrooms

Mushroom production of 5 700 000 kg, valued at \$15,000,000, was marginally lower than the previous year. About 70 per cent of production went to the fresh market and the rest was processed. Control of the important disease, bacterial blotch, using antagonistic bacteria was in the final stages of evaluation. Research on the cultivation of other edible mushrooms was also undertaken.

Technology in Vegetable Production

The area of vegetables under micro irrigation increased significantly in both coastal and inland areas with reported yield increases of up to 50 per cent. Other technologies adopted included computerised scheduling of watering, inline injection of pesticides and fertilizers, and plastic mulches.

Container Grown Seedlings

The use of container grown seedlings for establishing crops continued to increase rapidly. Advantages for establishing processing tomatoes were recognised, particularly early in the season. A number of small specialised seedling growers began operation in vegetable producing areas.



Export Initiative

Growers in south west New South Wales exported trial shipments of capsicums and rockmelons, and larger quantities were planned for the coming season.

Postharvest Handling and Marketing of Horticultural Crops

Because of the size of the loss to the horticultural industries through inadequate postharvest care of produce, the Department reorganised and upgraded its postharvest advisory services. Most sections of the marketing chain were ignorant of correct methods of handling produce. A major seminar was conducted at Flemington Markets to educate growers, marketers, transport agents, merchants and retailers about latest developments in the use of temperature control to maintain product quality.

A statewide advisory programme encouraged all members of the marketing chain to adopt new handling techniques and technology.

ORNAMENTAL HORTICULTURE

Trends in the Industry

The number of registered nurserymen increased by about 15 per cent during the year. However, returns to growers in the nursery industry over the last 10 years had not kept pace with inflation, and many were facing financial difficulty after an unusually bad autumn and early winter period.

One reason for the downward pressure on prices was the increasing proportion of plants marketed through chain stores. This situation also emphasised the low standard of care of living products once they leave the grower.

Despite the slowing of industry growth, it continued to be very valuable. Its relative newness and the fact that thousands of different

More hybrid varieties of vegetables such as brussels sprouts were used by growers.



species were involved meant that reliable growing and marketing information for Australian conditions was scarce.

Research designed to establish methods of extending shelf-life will soon begin using a controlled environment room recently completed at the Horticultural Research Station, Gosford. This facility will also enable Australian native plants to be screened for suitability for use indoors, either as foliage plants or flowering pot plants. This research is important because the development of a sizeable export market for ornamentals is likely to depend on the production of plants which are unknown or unusual on world markets.

Kentia Palms

The world demand for kentia palms (*Howea* spp.) is already strong, but difficulties are experienced both here and on Lord Howe Island because of slow germination. A research project was set up to determine the quickest, most reliable method for inducing germination.

SEEDS INDUSTRY

Production and Trends

New South Wales is an important producer and a major user of seed. Because of the State's environmental range, which encompasses temperate, tropical, Mediterranean and arid regions, New South Wales seed growers continued to produce a larger range of crops than any other State. Organisation of seed growers and other industry groups improved in recent years, largely in response to the awareness of a need for improved marketing methods. Two grower organisations were formed for the specific purpose of marketing their GH maize and Redquin red clover seed.

Production and Quality

The extremely wet summer seriously affected productivity and quality of New South Wales seed crops. Cereal seed crops, while generally adequate in quantity, were frequently weather-damaged leading to reduced germination and keeping quality. Similar problems were recorded with soybeans and other grain legumes, and most certified seed crops produced in the north of the State were lost to the persistent summer rain. Lupin production and quality was acceptable. Oilseed rapeseed production was adequate, but individual crops were weather damaged.

Pasture seed production was disappointing. Yields of the perennial grasses were low and the summer rains caused major damage to mature crops of subterranean clover, white clover and the annual medics planted for seed production. Most lucerne seed crops produced poor crops, and many were not harvested. Redquin red clover was an exception, as it set and matured large seed crops in paddocks adjacent to failed white clover, medic, and lucerne crops.

Tables showing production of certified pasture seed, registered cereal seed, and certified grain legumes, oilseeds and hybrid maize are included in Appendix I. The number of seed samples tested in the Department's seeds laboratory are also tabulated in Appendix I.

New Cultivars

Production of several new cultivars under the seed certification scheme occurred for the first time in 1983-84. A small quantity of basic seed of Dalkeith sub clover was produced, and the line DA 20.19.2 was seed-increased in preparation for its registration and release in 1984-85.

Seed of the new soybean, Suttor, was certified, while several other lines of this crop were seed increased in anticipation of registration. Other new cultivars planted for the first time included Noonan kikuyu, Uneta phalaris, Trifecta and Sequel lucernes, and several unregistered un-named lines of oilseed rape and chickpea.

New Schemes

A pedigree scheme for the production of certified subterranean clover was started. This scheme was necessary because certification staff were unable to distinguish certain

Certified and Registered seed is tested by the Department for purity.



cultivars during crop inspection. Other temperate climate States agreed to conduct similar schemes.

A scheme for the labelling of uncertified subterranean clover seed mixtures was started in cooperation with the Riverina branch of the Seed Industry Association.

Legislation

The Seeds Act, 1982 became effective on 1st December 1983. By 1st December 1984, all sellers of seed sold for sowing in New South Wales must provide seed buyers with a written guarantee of each seed lot's physical purity, weed seed content and germination. Agricultural inspectors played an active role by promoting the legislation, with pleasing results.

IRRIGATION

Production and Trends

The trends toward more efficient on-farm irrigation will continue through the use of landforming technology, irrigation scheduling, drainage reuse and on-farm storage of water supplies.

During 1983-84, the water supply improved throughout New South Wales. However, irrigation supplies were substantially unused because of mild summer weather and continuing rain over much of the State.

The irrigated area of the State remained at about 800 000 hectares, about 94 per cent of which was irrigated from surface water sources. Over 40 per cent of irrigation was managed by licensed diverters of water; most of the remainder was located in the southern irrigation areas and districts.

Water Scheduling

The Department continued its on-going irrigation scheduling service for several crops, which will reduce water use while maintaining production. The Water Watch service, particularly applicable to wheat, was available from Griffith, and horticultural scheduling services were also available. As a trial, estimates of plant water use were provided to district agronomists in northern and western areas.

Loans

Over 50 applications for low interest loans were evaluated, and reports made to the Water Resources Commission.

WEEDS

The breaking of the drought in March 1983 and the excessively wet summer of 1983-84 encouraged prolific weed growth. Particularly concerning were fireweed, Paterson's curse, Johnson grass, spiny burr grass, nodding thistle and other thistles, and summer growing annuals. The State Government increased an initial allocation of \$2,500,000 with a special grant of \$380,000 to help councils control noxious plants because of the particular seasonal conditions.

Parthenium Weed

The spread of parthenium weed from Queensland to New South Wales continued, with major outbreaks in the Moree Plains and Narrabri Shire areas. About 150 infestations were located and destroyed. An awareness campaign conducted mainly in the New England area was very successful, and encouraged numerous reports of the weed. Contaminated headers from infested Queensland areas were the major cause of the plant's spread into New South Wales so plans were made to deal with the problem in the next harvest season.



Water Hyacinth

Conditions favoured the growth of water hyacinth in the Gingham Watercourse near Moree for the first time in several years. The control programme developed by the Inter-Governmental Liaison Committee contained the outbreak. Seed germinated in the seed pool areas identified by the University of New England, but all outbreaks were successfully treated by the local shire, except where hyacinth was obscured by other plants.

Serrated Tussock

The State Wide Attack on Tussock (SWAT) campaign in the central and southern tablelands continued, with considerable control of serrated tussock in arable and scattered infestation areas. Excellent liaison between the Department and local government councils established a framework for extending the campaign to problem areas.

Community Weeds

Results of a special urban weed study will be used to formulate amendments to noxious plant legislation, and to plan an awareness campaign. The main weeds are privet, lantana, morning glory, pampas grass, bitou bush and crofton weed.

Research

The new weed research and demonstration unit at Glen Innes carried out 31 trials in 1983-84 involving 14 major weeds of cropping, pasture and other areas.

The weed research and demonstration unit at Orange carried out 30 demonstrations and trials throughout central and southern New South Wales. Control of weeds in

winter cereals was the major area, with other work done on the control of noxious plants in pastures. Trials on both nodding thistle and true Scotch thistle (*Onopordum* spp.) provided herbicide data for advisory officers and agricultural chemical companies.

Biological Control

The Department supported CSIRO's alligator weed, water hyacinth, St John's wort, common heliotrope, skeleton weed and salvinia programmes. CSIRO were also helped to assess the potential for two new programmes on silver leaf nightshade and on nodding thistle and other *Carduus* spp. The blackberry rust, *Phragmidium violaceum*, was reported on the northern tablelands in April, following its alleged illegal release in Victoria in late 1983. Agents introduced into Queensland for the biological control of groundsel bush, ragweed, parthenium weed, and noogoora and Bathurst burrs were released in northern New South Wales.

REMOTE SENSING

The Remote Sensing Section developed six programmes, including the collection of census data on rice and winter cereals from Landsat data as reported under *Wheat and Other Cereals*.

Agricultural suitability mapping of the Cabonne and Parkes Shires was completed using 1:100 000 scale rectified Landsat images, and other areas were being mapped.

Six images of the Orange-Dubbo area were acquired to investigate how Landsat data can be used in the management of an advisory district.

Development of a weed detector for use in no-till cultivation started in 1984 with support from the Wheat Research Council. Field data was being collected for a cooperative programme with the University of New South Wales and NASA to investigate the effect of soil moisture and surface texture on radar imagery.

SHEEP

Production and Trends

The New South Wales sheep and wool industry was expanding after three to four years of drought. Strong and continuing producer optimism for wool was influenced by the good outlook for wool prices, the strong demand for replacement store sheep, and by some doubt about the future viability of alternative enterprises. Despite one of the State's worst droughts, total sheep numbers increased by 4.8 per cent to 50 400 000 as at 31st March 1984 (ABS preliminary estimates). Producer confidence was reflected in the increase of 7.2 per cent in the

The Department continued to advise farmers on the safest and most economical ways to control weeds such as blackberry.



number of breeding ewes. The improved seasonal conditions led to the adult wool cut per head averaging 4.95 kg, the highest for many years.

The gross value of New South Wales wool and sheepmeat production increased from an estimated \$730,000,000 in 1982-83 to \$765,500,000 in 1983-84. The number of ewes to be joined to Merino rams was expected to rise 27 per cent, and by 12 per cent to other breed rams.

Sheepmeat marketing, particularly of lamb, continued to face growing competition, with producers receiving prices that were 40 to 50 per cent lower in real terms than in 1980. Interest in improved marketing methods, development of new products and in improving consumer image continued to increase.

Advisory

Four inter-regional, five regional and 131 district programmes covered genetics, nutrition, management, production and marketing. Officers supplemented property visits, field days and mass media items with 166 field investigations and demonstrations.

Alternative Marketing Methods

The New South Wales Livestock Marketing Study Group (sheep and lambs) examined alternative marketing methods for slaughter sheep. Two manual and six computerised lamb auctions-by-description were held to test sale conditions and operational

procedures, and the Australian Council of Livestock Agents was introducing a similar, national sale-by-description system. Thirty eight livestock appraisal courses were conducted for 676 participants between September 1981 and December 1983. Livestock agents, producers, market reporters, meat buyers and Futures Exchange staff increased their skills in assessing live lamb and sheep carcase characteristics.

Genetic Improvement

Genetic improvement is needed in the growth rate and fatness of meat-sheep to combat low prices, increased costs, and competition from other meats. Greater consumer resistance to fat, combined with sale by description, revised export production descriptions, and new lamb products, increased the need for genetic progress. The Department's meat-sheep testing service provided objective information on growth rate and fat depth to help stud breeders make better sire selection decisions, improve their ram marketing procedures, and in turn influence the growth and fatness of lambs produced by prime lamb producers. Partly supported by Australian Meat Research Committee funds, the service tested 9500 rams on 90 studs of nine different breeds during the year. A major advisory programme involved Agfacts production, small-scale practical field days, major sheep show and ram sale displays, and liaison with industry committees.

Objective Measurement

A major thrust to promote efficient industry utilisation of objective measurement in selection programmes for improved wool production continued. Major activities included six field days on objective measurement in sheep breeding, two courses for stock and station agents, and a training workshop for country based sheep and wool instructors of the Department of Technical and Further Education. Considerable progress was made in the development of microcomputer software packages to help incorporate objective measurements into breeding and ram selling programmes.

Sheep reproduction

Another statewide programme provided farmers with soundly based nutritional, genetic, managerial and animal health information that will improve sheep reproduction. A sheep reproduction calendar was produced, a comprehensive extension kit was compiled for advisory officers, and 24 Agfacts on various aspects of sheep reproduction were being prepared.

Sheep Blowfly

The annual cost of the sheep blowfly to New South Wales sheep producers is more than \$35,000,000, and consequently the control of the sheep blowfly was an ongoing part of most sheep and wool advisory officers' programmes. Jetting races were used to reduce the labour required to apply chemicals that control fly strike, and the effectiveness of various types of jetting races was compared with manual jetting.

A mulesing and tail length display using diagrams and live sheep was used extensively at 70 agricultural shows and major field days throughout the State to demonstrate correct mulesing and tail docking technique.

Research

The amount of genetic resistance of Merino sheep to body strike and fleece rot was being assessed. The relative importance of body strike resistance to other important productive traits was also being assessed to enable the formulation of a breeding strategy to improve

overall productivity. Selection against this disease should be effective because resistance to fleece rot includes a substantial genetic component. The progress that could be made in resistance to fleece rot as a correlated response to indirect selection for various skin and/or wool traits was being investigated.

The experimental programme was mainly concerned with assessing the predisposition of sheep to fleece rot and body strike in relation to the wetting and drying characteristics of the fleece and the resistance of the skin to *Pseudomonas aeruginosa* and moisture challenge. The experimental sheep include samples from all Merino strains, which are known to vary widely in body strike resistance. The establishment of a facility to experimentally induce fleece rot and body strike allows the degree of resistance/susceptibility to be estimated independently of the prevailing environmental conditions.

The economic importance of body strike to the Merino wool industry was being estimated to determine the emphasis that should be placed on this trait in breeding programmes.

The Border Leicester Improved (BLI), a strain of Border Leicester (BL) sheep into which some Merino (M) high fertility genes and pneumonic resistance genes were infused, was being compared with BL rams as sires of first cross sheep and grand-sires of second-cross lambs. The use of BLI x M versus BL x M ewes could increase the number of lambs marked per ewe by 10 per cent per annum.

The average wool cut per head of adult sheep was the highest for many years.



The immunisation of BL x M ewes against androgens or oestrogens (sex hormones) was investigated as a possible method of increasing twinning rates and advancing the onset of the breeding season. The immunised ewes produced more lambs than the control group of ewes, mainly due to more twin births.

Work continued on developing a mobile scanning unit which can operate economically and accurately in the field to determine litter number in pregnant ewes.

Selenium deficiency has long been recognised in the northern tablelands in the form of white muscle disease, and some production responses have been observed. A series of experiments was conducted to determine the size and distribution of production losses, and to provide better information about selenium nutrition in the area.

Animal Welfare

The Department's involvement in the welfare of farm animals increased with the widening of community interest. Submitting animals to unnecessary stress is not only cruel but leads to lower production, and it is in everyone's interest to ensure that stress is minimised.

An analysis of departmental sheep and wool production recommendations showed that they complement many welfare group principles. Other specific inputs to the animal welfare area by advisory staff included a workshop held at Orange during May 1984 and a submission to the Senate Select Inquiry into Animal Welfare.

Ovine Brucellosis Accredited-Free Flock Scheme

The scheme continued to expand, with 721 flocks representing 22 breeds of sheep accredited as at 12th June 1984. Despite less stringent entry conditions, the breakdown remained at less than 1 per cent of all flocks accredited. Ovine brucellosis is a significant cause of ram infertility in Merino flocks in western New South Wales, and the increase from 10 to 17 per cent of Merino studs now in the scheme was an important advance.

Sheep Health

The Department mounted a major advisory programme on the treatment and control of ovine footrot, supported by the sheep industry and commerce.

Investigations were made into suspected breakdowns in vaccination programmes, and other research studies were aimed at improving the quality of the vaccines currently available.

While there are many causes of wool derangement, attention focused on itchmite as an important agent. Field studies underway will determine the prevalence of itchmite in commercial sheep flocks, and make observations on factors which affect the occurrence of the itchmite. The response of the itchmite to conventional sheep louse control treatments was also being examined.

Resistance by worms to many of the commonly used anthelmintics has been known in New South Wales for many years. As part of an on-going monitoring system, extensive field trials were carried out on the northern and central tablelands. These showed resistance to a number of anthelmintics by the three common internal parasites of sheep and how livestock owners can determine the presence of the problem in their sheep flocks.



increase of only 98 000 for the year. No significant herd re-building was expected over the next two to three years, owing to the high female slaughter rate this year, cash flow deficiencies and better alternative investment opportunities.

Alternatives to the traditional saleyard auction of slaughter cattle were further developed with the introduction of carcase classification and carcase description.

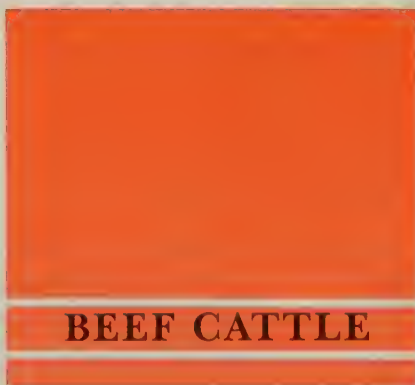
Sale-by-description, with direct movement of stock from property to slaughter, generated a great deal of interest, with major pastoral houses and independent stock agents developing alternative options to the industry funded New England Livestock Computer Marketing Scheme (NELCM).

Advisory

The development of sale-by-description created a need for buyers, producers and stock agents to develop skills in the assessment of live cattle prior to slaughter. During the year the Department conducted 60 training activities for this purpose, and assisted NELCM, stock firms and pastoral houses in staff training programmes.

The need for producers to quickly regain income earning capacity from drought depleted herds created an unprecedented interest in crossbreeding. To service this interest, the beef section conducted field days, farm walks and meetings, was publishing a booklet on crossbreeding, and helping to establish "first cross" female sales.

With beef producers facing decreased domestic consumption of beef and increased cost of production, many want to completely re-assess the investment and production efficiency of their beef enterprise. The Department developed a two-day workshop package for beef producers to analyse the physical and financial aspects of their enterprise. The workshops will be implemented in 1984-85.



Production and Trends

Statewide rain during the autumn/winter of 1983 produced excellent grazing following the drought, but not without some problems. High individual losses from bloat were up to 5 per cent of stock, which exceeded drought losses on some tableland properties.

High stock prices and lack of capital constrained beef cattle herd expansion during the year. At 31st March 1984, there were 4 616 000 beef cattle in New South Wales, an

Research

Selection for one or more measures of growth rate is the basis of most existing breeding programmes for cattle. Although faster growing animals are generally considered to be more efficient, there is little information available. Faster growing animals reach a specified weight more quickly, but they generally eat more feed and take longer than slower growing animals to reach the same level of "finish" (possibly a more important criterion). Faster growing animals usually achieve a greater adult weight, and larger cows are therefore needed to produce faster growing calves.

Research underway will provide practical information on the commercial value of selection for a larger type of animal, and will enable the formulation of an appropriate selection policy to optimise total herd productivity.

Research results indicate that early weaned, drought affected calves can be successfully finished in a feedlot system using pellets alone. The addition of roughage to the diet improves performance and reduces days to finish.

Brucellosis Eradication Campaign

The second round of field monitoring testing was completed in Orange, Dubbo and Bourke veterinary office areas, while the third round of testing was well underway in all other areas of the State.

The prevalence of brucellosis was further reduced in 1983-84. Progress over the last seven years as recorded on the Australian National Disease Information Service (ANADIS) computer is shown below:

Brucellosis prevalence in New South Wales 1977-84

Date	1977	1978	1979	(30th June)		1982	1983	1984
Herd prevalence (per cent)	29.5	10.1	9.75	4.78	1.31	0.49	0.23	0.18
Cattle prevalence (per cent)	3.1	1.3	0.21	0.17	0.66	0.03	0.01	0.01
Number of known infected herds	8 983	6 949	3 446	2 081	644	262	125	98

Details of progress in herd status and regulatory activity are summarised in Appendix II, and details of serum sample testing are in Appendix I.

In 1983-84, field testing of 1 450 000 cattle involved 22 000 property visits and the testing of 17 000 herds. Intensive investigation into all possible herd breakdowns continued, with the number of breakdowns steadily decreasing.

The development of the ELISA test for bovine brucellosis was completed and put into operation at all regional veterinary laboratories, where most samples from the eradication campaign were tested. This test supplies additional information to that obtained from the other two tests routinely used. It is very sensitive, and proved especially useful in the early detection of infected animals in certain herds.

Other monitoring to detect infected herds included the testing of over 300 000 blood samples collected at abattoirs, and 26 599 milk samples from dairy herds. Monitoring also showed the falling level of brucellosis in the New South Wales cattle population.

A major advisory programme began in July 1983 to keep the cattle industry aware of the dangers of brucellosis and the need to maintain vigilance until final eradication. A telephone survey conducted in December 1983 showed that the great majority of cattle owners had been reached through the media. The advisory programme will continue to publicise pertinent facts about the brucellosis eradication campaign.

Tuberculosis Eradication Campaign

All large dairy herds were tested following the evaluation of a breakdown in a large herd in 1982. After detection of a second large dairy herd with TB, a precautionary check test on all 3000 dairy herds in New South Wales was initiated. By the end of June 1984, about 1200 dairy herds had been tested under this programme and only one herd with TB found. The number of



infected herds dropped from 16 to 13 during the year.

Check testing of herds with a history of infection in the previous 10 years continued and led to the detection of two infected herds. Testing of herds following abattoir traceback revealed four infected herds, as assessed by the presence of reactors with lesions at slaughter. The abattoir traceback system continued to detect TB in the cattle population at a sufficient rate to identify infection before it spread to other herds. Details of herd status and regulatory activities are shown in Appendix II.

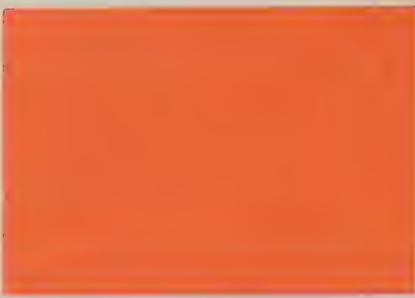
Cattle Tick and Tick Fever Control

The new cattle tick control programme, which began on 1st July 1983, gave stock owners responsibility for control of catue tick on their stock, with the Department and the Board of Tick Control providing advice and assistance.

Phasing in of the change began with the elimination of the compulsory strategic dipping programme in the Tweed, Kyogle, Woodenbong and Bonalbo areas.

A voluntary programme was recommended to all stock owners in the tick quarantine area (TQA) except in Cullendore and North Tabulam areas which were being considered for release. The good owner response was highest in the old dipping areas, and lowest further south in the TQA.

West Cullendore was under surveillance, but as no ticks were found the area was recommended for release after 30th June 1984. North Tabulam and East Cullendore both had one infestation during 1983-84 and were retained in the TQA.



DAIRY CATTLE

The simplified procedures for entry of Queensland cattle to the TQA proved popular, with 200 entering this year compared with 81 in 1982-83.

All herds were examined for cattle tick, but only 11 infestations were found, compared with 25 in 1982-83. The major reduction was in the old examination area, where infestations fell from 20 to five. No tick fever occurred, although in recent years there had been an average of one case per annum.

Under the new policy, the 1100 operational dips in the TQA are to be handed over to stockowner control starting on 1st July 1984. Three dips were handed over to producer groups to gain experience.

Major activities of the Board of Tick Control are shown in Appendix II.

Stomach Fluke

Stomach fluke are widespread in cattle in coastal and irrigation districts, and under certain circumstances they kill cattle. Recent evidence suggests they can also have a deleterious affect on cattle production. Detailed studies were therefore started on the life history of the parasite, its pathology and epidemiology, and on treatment and control methods.

Heptachlor Residues

Heptachlor was previously used to control insect pests of potatoes. Subsequent grazing of contaminated land results in build-up of residues in cattle. Results of studies on the occurrence of heptachlor in soils and the rate of build-up and decline in animals provided information for advising farmers how to handle the problem of contaminated paddocks.

Production and Trends

Milk production in New South Wales increased by about five per cent due to a combination of the drought breaking and a continued improvement in efficiency by most dairy farmers.

Promotion by departmental advisory officers helped increase the number of dairy farmers participating in the New South Wales dairy herd improvement programme, despite a reduction from 50 to 30 per cent in the Department's contribution towards herd recording. The information obtained from recorded herds was used to select superior bulls for use in the dairy herd improvement programme.

The second release of Australian breeding values by the Australian dairy herd improvement scheme stimulated increased useage of artificial breeding by dairy farmers.

Research

Dairy cows grazing kikuyu pastures are prone to energy and mineral deficiencies during maximum milk production at about six weeks after calving. An experiment studied the effect of energy and mineral supplementation of grazing cows on milk production parameters. The lowest milk yield was obtained from the base pasture, with mineral supplementation only increasing production slightly. The highest yield was obtained when a feed supplement was fed together with a mineral supplement at a constant rate.

Mastitis Advisory Service

The mastitis advisory service operated by the Department and the NSW Dairy Corporation found that the level of mastitis measured by the average bulk milk cell count (BMCC) continued to decline. The

average BMCC for 1983-84 was 408 000 cells per millilitre, compared to 440 000 in the previous year. Reducing mastitis improved production by ensuring that cows produced to their full potential.

Surveys conducted by several local mastitis advisory groups showed that 63 per cent of farmers dipped the teats of all cows after milking; 49 per cent treated all cows with antibiotics at the end of the lactation; and 39 per cent treated some of their cows. These figures demonstrate substantial industry adoption of the main elements of mastitis control, but the surveys showed that poor milking machine maintenance and use of inappropriate antibiotic products were common problems.

Other Diseases of Dairy Cattle

See section on Beef Cattle for information on tuberculosis, brucellosis, cattle tick and tick fever.

Herbicide Contamination of Milk

Potential contamination of milk from dairy cows which had grazed African lovegrass, *Eragrostis curvula*, treated with the herbicide Frenock® was studied at Bega. Urine, milk, faeces and blood were monitored over a treatment and withdrawal period. Low levels of herbicide were found in milk in the treatment period, but these declined rapidly when uncontaminated feed was introduced.



GOATS

Research

The use of goats to control the low quality native grass, poa tussock, was investigated. They reduced both the average height and the percentage ground cover of the tussock within 12 months, and converted it from a dominant plant to a minor part of the pasture.

Preliminary estimates of genetic parameters (cashmere down weight and diameter, and liveweight) for various trials associated with cashmere production in feral goats indicated that selection should be an effective means of improving productivity. There was a strong positive genetic relationship between down weight and down length, indicating that down length can be used to indirectly measure down weight in breeding programmes.

The studies also indicated that there is no genetic variation for skin follicle density, but that density does vary with environmental influences. A knowledge of these influences would enable the design of management systems conducive to follicle formation. Bodyweight, age and nutrition variables were examined, and investigations into possible environmental influence on skin biology continued.

Health

Johne's disease continued as a major problem in dairy goat herds. In addition to the quarantine and slaughter procedures, the Department was investigating the role of general hygiene in controlling the disease.

Research on goats showed, among other things, that they could be used to control poa tussock.



PIGS

Production and Trends

The past year was one of the least profitable for 20 years. Prices for the most popular carcase weight and fatness specification of bacon pigs (G 2/3) dropped from 157 cents per kilogram in July 1983 to 141 cents per kilogram in November 1983. By June 1984 the price had risen to 170 cents, with the average return over the year being about 160 cents. Profit margins were slim, with only very efficient producers obtaining a return on capital invested. From July to December, profitability was adversely affected by drought-increased feed prices, with grower feeds costing between \$220 and \$240 per tonne.

Production for the year was expected to be about five per cent greater than the previous year due to a herd build-up in 1982 following very high prices. As at 31st March 1983, there were 4589 piggeries with

a total of 794 000 pigs, including 95 500 sows and 8200 boars. Although the number of sows rose by 2500, and boars by 300 over the previous year, there was a decrease of 114 in the number of piggeries. A total of 1 081 000 pigs were slaughtered during the year.

Advisory

Pig section advisory officers assisted in the organisation and operation of the National Pig Marketing Workshop held in February 1984. The major recommendations were to investigate ways of further improving electronic marketing systems; to assess the need for a single national pig marketing authority; to provide improved market information; and to publicise the need for premium payments for quality products.

Sale-by-description involved agents and buyers operating from video terminals at Homebush, Dubbo, Gunnedah and Casino. It was to be extended to include participants in Queensland and South Australia in the latter part of 1984.

This form of computerised selling continued to expand and provide a benchmark for establishing prices in the consignment selling of pigs. (It was estimated that more than 80 per cent of all pigs marketed in New South Wales were sold by consignment).

For the year ended 30th June 1984, 48 414 pigs were sold from a total of 53 784 offered for sale-by-description — an increase of 71 per cent in pigs offered, and 84 per cent in pigs sold by description.

The Department officially launched its "Piggy Bank" computerised pig performance monitoring and data bank service in October 1983 at the Pork and Bacon Fair. It provided information on herd performance, highlighted potential management and managerial problems, and was assisting 61 producers at the end of the period.

Research

An investigation was conducted to determine whether the lower performance of pigs was due to the lower net energy content of the lupin-seed meal they were fed. A comparison involving lupin-seed meal



and soybean meal diets indicated that the difference in growth rate was not due to differences in net energy, but due to lower availability of the amino acid, lysine, in lupins.

A comparison of several pig feeding systems indicated that profit maximisation requires *ad lib.* or hi-lo feeding (i.e. *ad lib.* to 50 kg liveweight then restricted feeding) during the cooler months to be replaced by a regime of severe feed restriction in summer. Hi-lo is recommended where it is desired to implement one year-around feeding system.

An investigation was also carried out into the feeding of high lysine diets to produce lean carcasses. The results indicated that to maximise profitability, a high lysine diet should be fed *ad lib.* during winter and on a hi-lo basis in summer.

Health

Encephalomyocarditis (EMC) continued as a serious disease, causing pig deaths on the north coast of New South Wales. A number of cases of EMC were reported in the central west and north west where it had not occurred for several years. The cases were confirmed by virus isolation and cell culture at the Central Veterinary Laboratory, Glenfield. The outbreak appeared to be associated with the mouse plague.

Swine pox, another viral disease of pigs associated with a pest plague, was spread by mosquitoes following the heavy rains early in the year.

evident throughout the year as economic pressures and attractive quota prices encouraged smaller flock owners to leave the industry. In April 1984 there were about 3 500 000 hens on 516 farms, of which only 256 had more than 5000 laying hens, and seven had more than 50 000 laying hens.

The egg industry continued to be troubled by overproduction despite further quota cuts and conditions limiting the number of operative quotas. During 1983-84 the New South Wales Egg Corporation and the Poultry Farmers Licensing Committee introduced a number of measures designed to further reduce the surplus; to minimise evasion; to distribute the equalisation costs more equitably between producers; to shift the burden of equalisation from consumers to producers; and to increase the sale of eggs on the domestic market. The measures were apparently beginning to take effect. It was expected that surplus production would be significantly reduced during the next 12 months, provided that producers continued to abide by the legislation and maintain an orderly system of egg marketing.

New South Wales produced about 45 per cent of Australian poultry meat, and about 100 000 000 chickens were raised on 500 contract or company farms throughout New South Wales. The gross value of the State's poultry meat production (including turkeys, ducks and other species) was about \$200,000,000.

Increasing numbers of pheasants and other game birds were grown for the restaurant trade.

Three major companies continued to control about 80 per cent of the total production of chickens, turkeys and ducks.

Due to over-optimistic projections in the early 1980s and a number of other factors, the chicken meat industry had a surplus of chicken growing facilities. This surplus was spread unequally between the major companies and regions in the State. As a result, the throughput, and subsequent income, of some growers was severely reduced.

Improvements in the genetic potential, nutrition, husbandry and management of flocks contributed to further increases in the efficiency of production. In 1984, the "average" broiler flock was marketed at 45-50 days of age at a liveweight of about 2 kg and a feed conversion ratio of 2 kg feed per 1 kg meat produced. The production of turkeys, ducks, geese and game birds increased throughout the year but no accurate statistics were available.

Advisory

The National Farm Management Recording Scheme and the Random Sample Layer Test provided further valuable information for planning and evaluating research and advisory programmes, flock replacement programmes, credit applications and marketing strategies. Particular emphasis was placed on helping farmers redesign their flock replacement programmes following quota cuts and a decision by the

POULTRY

Production and Trends

New South Wales produced about 45 per cent of Australia's eggs. The gross value of New South Wales eggs produced in 1983-84 (80 000 000 dozen) was about \$100,000,000. Further consolidation of farms was



NSW Egg Corporation to transfer levies from eggs to hens.

An operations manual for the National Farm Management Recording Scheme (Eggs) was published which includes a problem solving strategy and a checklist for diagnosing the causes of sub-optimal performance of layer flocks. This proved to be a valuable management and advisory tool.

Poultry advisory officers initiated field trials and/or demonstration projects on biogas production; methods of brooding broilers; litter materials; amino acid levels in layer diets; induced moulting; and fly control on layer farms. They were in demand as speakers at field days and meetings for small area farmers at Mudgee, Tocal, Macksville and Tamworth in addition to AgQuip at Gunnedah and the Royal Easter Show in Sydney.

Poultry Feeds

Investigations continued at the Seven Hills Agricultural Station into factors influencing the availability of the amino acid, lysine, in poultry diets. The results indicated that lysine availability showed greatest variation in meatmeals, cottonseed meals and blood meals. Research continued in improving processing conditions to enable the consistent production of high quality meatmeals.

Poultry Processing

The poultry processing industry continued to expand, and 14 new processing plants were registered. Growth was mainly in the rapidly expanding game bird market, but existing processors were also improving their viability by purchasing more mechanical processing equipment, diversifying into smallgoods production and utilising otherwise waste products as pet food.

Health

An extensive investigation into chronic respiratory disease, *Mycoplasma gallisepticum*, in Tamworth area flocks revealed its widespread occurrence, and the factors responsible for the high prevalence. Control methods implemented on some farms eliminated the disease on those farms.

Fly Control

Fly control studies were started on commercial egg producing farms. The studies involved identifying beneficial insects in poultry manure and assessing their importance in controlling flies; detecting fly resistance to insecticides in current use; and evaluating experimental insecticidal compounds for use in poultry sheds.



Carcase Classification and Related Marketing Schemes

Beef carcass classification trials in New South Wales abattoirs finished on 30th June 1983 with the incorporation of the New South Wales Meat Inspection Service into the Commonwealth Export Inspection Service (EIS). Despite the end of State Government financial support, beef carcass classification continued at all centres.

Electrical stimulation of carcasses

An estimated 75 per cent of pigs slaughtered in New South Wales during June were monitored for backfat thickness.



prevents the meat toughening effect associated with rapid chilling. The New South Wales Meat Authority's gold branded beef scheme for young electrically stimulated carcasses is a major use of beef classification parameters. At year's end gold branded beef carcasses were available from 19 New South Wales abattoirs, including seven with export licences. During March 1984, 17 per cent of all beef carcasses destined for the domestic market were gold branded.

By 30th June 1984, 17 New South Wales abattoirs (10 with export licences and 7 domestic (including Canberra)) were measuring backfat on pig carcasses under EIS monitoring. Although backfat monitoring was not compulsory for pigs destined for domestic consumption, it was implemented by all abattoirs measuring pig carcass fat depth. During June 1984, an estimated 75 per cent of all pigs slaughtered in New South Wales were being monitored for backfat thickness.

The Livestock Marketing Study Group (sheep and lambs) conducted additional trial lamb auctions-by-description during late 1983. The experimental auctions involved abattoirs at Blayney, Cowra, Mudgee, Homebush and Gunnedah, where staff received instruction in carcass classification and EIS officers were trained in monitoring classification accuracy. Abattoirs at Gosford, Canberra, Wyong, Forbes and Macksville later developed the necessary expertise to monitor lambs being traded by carcass description.

Amendments to the Apiaries Act, 1916, which was last amended in 1944, were approved by Cabinet in February 1984.

Research

An investigation into viral diseases of honey bees was completed at the Regional Veterinary Laboratory, Glenfield, and one new research project commenced. One project aim is to determine the most efficient treatment method for European brood disease, while the other aim is to develop a technique for detecting the presence of American brood disease and European brood disease before clinical signs of infection become apparent.

summer and autumn.

Departmental research found a consistent relationship between prolonged periods of dry weather and the occurrence of mouse plagues. A predictive model developed from this research in 1981 indicated that the improved conditions associated with the breaking of the drought will most likely lead to a major mouse plague during late summer and early autumn 1985.

The Department organised a statewide programme for monitoring mouse activity and damage. Seventy refuge/crop sites and 30 trap sites were being monitored throughout the grain belt. The trapping will indicate the disease and reproductive status of the population, and the information will enable forecasting of mouse population densities and distribution.

A Pesticides Order was issued to permit crop perimeter baiting with bromadiolone and brodifacoum baits. Departmental officers trained Pastures Protection Board staff to correctly mix and distribute bait. Boards in the badly affected areas mixed and supplied bait to ratepayers at cost.

Wingless Grasshopper

The wingless grasshopper outbreak in the southern tablelands ended when above-average rainfall during spring and early summer stimulated activity of parasitic nematodes.

Mice

Large numbers of mice were present during autumn 1984 over most of the State's grain producing areas. Their persistence was believed to be associated with the mild weather, and the peak of the plague was expected to occur during the following

As predicted by Departmental research in 1981, mice reached plague proportions during the good conditions after the drought.



HONEY INDUSTRY

Production and Trends

Marketing continued to be a major problem, with returns fluctuating widely from year to year. Honey export prices declined by \$150 per tonne during the year to about \$800 per tonne. One major honey packer sold floral varieties of honey through supermarket outlets to increase domestic sales. Some honey packers placed quotas on honey deliveries, which restricted the availability of storage containers.

As at March 1984, New South Wales had 4431 registered beekeepers owning 250 535 hives, an increase of 280 beekeepers and 6878 hives.

There was a continued gradual increase in the contract pollination of oilseed, small seed, horticultural and vegetable crops.

Standing Committee on Agriculture Workshop

The New South Wales Department of Agriculture hosted the first Standing Committee on Agriculture workshop for the apiculture industry during July 1983. The recommendations from this workshop will benefit the honey industry for many years to come, as will the published technical papers presented at the workshop.

Legislation

Honey is covered under the Farm Produce Act, 1983, which requires honey buyers to pay producers within 30 days following the month of delivery. The Act also requires honey packers to take out \$50,000 insurance against bad debts.

Before this legislation some honey packers were taking up to six months to pay producers, and one honey packer went out of business owing a considerable sum of money to beekeepers.

GENERAL PESTS AND DISEASES

Parasitism by these worms killed large numbers of young hoppers early in the season. Only very low numbers of wingless grasshoppers survived to the egg laying stage, and no outbreak was expected in 1984-85.

Australian Plague Locust

Plague locust numbers declined to very low levels during the drought. However, following the breaking of the drought in autumn 1983, successful breeding resumed over a wide area, and by late summer of the 1983-84 season a large scale outbreak had developed in the far western and south western areas of the State.

Breeding by concentrations of adults in early January 1984 resulted in bands forming after hatching in early February in the Broken Hill, White Cliffs, Cobar, Hillston-Mossgiel and Balranald areas. The size of the outbreak in the south-west plains and lower Darling areas was not apparent until late February following fledging and subsequent swarming of adults. During March, swarms moved in a south-easterly direction, invading more closely settled districts. Extensive egg beds were produced throughout the source area and areas invaded by swarms during March. A major outbreak was expected in spring 1984 in the south west of the Western Division and in the Western Riverina.

Wild Dogs

A comprehensive review of wild dog control in New South Wales was considering submissions from various interested parties and should be completed by early 1985. The information helped provide an effective strategy for reducing the incidence of wild dog predations.

Rapid Screening of Salmonella

Salmonella, a group of bacteria pathogenic to animals, can cause a number of diseases, including food poisoning. Food and feeds are therefore regularly tested for salmonella, but the most acceptable of the test procedures are extremely cumbersome, expensive and time consuming. A departmental project was developing a rapid, reliable, inexpensive and simple immunoassay for salmonella. A simple method for isolating highly purified salmonella

flagellins and immunoradiometric assays for salmonella detection were developed. The effectiveness and specificity of these immunoassays were being compared with the standard salmonella assaying techniques.

European Wasp

European wasp, *Vespula germanica*, is a major pest of beehives in Europe and New Zealand. It is attracted to a variety of food, and can inflict a painful sting which makes it a severe social nuisance. European wasp was first found to be established in New South Wales (Sydney region) in January 1978, and a control campaign was started by officers of the entomology branch using insecticidal sprays and dusts applied to all wasp nests discovered.

A marked increase in the number of wasp sightings and nests reported during 1983-84 resulted in the employment of a team of departmental field officers to carry out survey and control measures from January 1984 throughout the Sydney Metropolitan Area and adjoining districts. Wasp nests were also discovered in some country areas, and separate campaigns were conducted against these.

The total number of nests destroyed in the Sydney region to date is 271 (154 during 1983-84). About 22 nests were located and destroyed in country areas. A very large proportion of nests was found to be concentrated in the southern suburbs of Sydney, bordering the Georges and Port Hacking River Systems. Nests are, however, known to be widely distributed throughout the Metropolitan area, along the near south coast to Wollongong, and probably also in the Gosford-Newcastle area.

During 1983-84, European wasp was gazetted under the Plant Diseases Act, 1924. The control campaign was highly successful in reducing the wasp population, but the discovery of nests over a wide area, and wasp sightings made late in the season, indicate that continuation of the control campaign will be necessary during 1984-85.

Pyrethroid Resistance in Cotton Bollworm

The 1983 detection of pyrethroid resistance in cotton bollworm, *Heliothis armiger*, reported in the 1982-83 Annual Report, was the first

confirmed case of field resistance in *Heliothis* spp. in the world. An insecticide management strategy implemented to control this serious pest consisted of limiting the use of pyrethroids to a maximum of three applications within the period from 10th January to 20th February (42 days being equivalent to one *H. armiger* generation). Before and after this period, growers were forced to rely on less effective insecticides. The strategy applied to all susceptible crops grown in the north west of New South Wales and southern Queensland, including oilseeds, coarse grains, cotton, grain legumes and tobacco. By rotating insecticides from at least three chemical groups, it was hoped that the levels of resistance in *H. armiger* could be maintained at manageable levels.

The Department, supported by the agricultural chemical industry and grower organisations, conducted an intensive publicity campaign to promote the strategy. This was highly successful and the strategy was widely accepted by growers. Monitoring of the levels of resistance in *H. armiger* by the Department's entomologists showed that pyrethroid resistant *H. armiger* were widely distributed in northern New South Wales, but at a low frequency. In November and December, 10 per cent of the *H. armiger* population in cotton was resistant to pyrethroids. The frequency of resistant individuals fell slightly in January and then increased to about 15 per cent at the end of the cotton season. It was generally a "light" season for *H. armiger* and control was excellent in all but a few cases.

FISHERIES

Production and Trends

Fish production remained relatively stable throughout 1983-84. Differences in catch between years generally do not represent any major

change in fish populations, but rather natural variations and shifts in emphasis to under-exploited species (for example red gurnard). In 1982-83 (the latest year for which catch figures were available) there was a relatively insignificant increase of 10 per cent over the previous year's catch — 24 972 tonnes compared to 22 320 tonnes for 1981-82. Value of the 1982-83 catch was \$36,000,000 for fin fish, \$20,000,000 for oysters and \$26,000,000 for crustaceans and shellfish.

Most species catches slightly increased, but red gurnard rose by 840 tonnes or 650 per cent, and trevally increased by 360 tonnes or 60 per cent. The major reduction was in tuna, which decreased by 300 tonnes or 26 per cent. Oyster production remained stable at 135 000 000 oysters. The catch of other crustaceans and molluscs was stable except for scallops, which fell by 50 per cent to 1300 tonnes.

Recreational fishing remained consistent and, with the breaking of the drought, inland streams carried large stocks of warmwater species and trout. A recent survey showed that the direct costs associated with recreational fishing (tackle, club fees, travel magazines, etc.) was about \$250,000,000 per annum.

Management

Discussions were held with the Commonwealth Department of Primary Industry, fisheries authorities from other States and industry representatives on management of the southeastern trawl fishery, the east coast prawn trawl fishery and the tuna fishery. Licence limitation was introduced for the prawn fishery as an initial step in the development of the management plan. Final management regimes for the two trawl fisheries were planned for introduction in 1985.

Management of the tuna fishery, finalised during 1984, will involve transferrable vessel catch quotas based on a formula which includes the previous three years' catches and the vessel's market value.

Commercial Marine Fin Fish

The survey by FRV *Kapala* of the trawl-fish resources in water deeper than 350 fathoms off New South Wales and north-eastern Bass Strait was continued. Areas of trawlable bottom were charted off Sydney-Newcastle, Jervis Bay and Ulladulla.

Promising catches of orange roughy and oreo dory were taken but no estimates had been made of their stock sizes. The fishing grounds were not as extensive as those higher up the slope and there were large areas of foul bottom and numerous canyons.

Further tagging of jackass morwong, and studies of tag related mortality, were carried out at Eden during October 1983. Results of the mortality study indicated that tagging caused no significant injury to the fish. These results were supported by the continuing recapture of healthy tagged fish by the commercial fishery two years after tagging in October 1981.

Measurement by *Kapala* of net spread and opening height taken over a range of trawling speeds continued which will allow fishermen to determine appropriate combinations of nets and trawl doors, and the optimum speed to tow their gear.

Preliminary involvement in the sashimi tuna trade started with the holding of specialised courses for fishermen on the southern, central and northern coasts. The courses will ensure that fishermen are familiar with the preparation of fish for the sashimi tuna trade, and will continue while there is a demand.

Recreational Marine Fin Fish

Tagging of rock blackfish, *Girella elevata*, by selected volunteer fishermen started. Over 500 were tagged and 26 recaptured, and the results indicated very little movement of juvenile fish.

For the eleventh year in succession a record number of fish were tagged around Australia by volunteer anglers. The total tagged was 8200, more than 2000 greater than during 1982-83. In north Queensland (Cairns/Lizard Island area), 803 black marlin were tagged and released, a record for that fishery.

There were 211 recaptures recorded during 1983-84, compared with 180 for the previous year. Distance records included a southern bluefin tuna tagged off western Victoria and recovered 8600 km to the west, off South Africa, 434 days later; and a yellowtail king fish tagged off Sydney and recaptured 1200 km to the north, off Rockhampton, after 271 days.

Black marlin recoveries included one small (35 kg) fish which travelled 800 km in only 14 days, and another of the same size which moved from south Queensland to the Republic of Kiribati (4200 km) in 210 days.

Fisheries production of all species, including tuna, fluctuates widely from year to year.



Tagging of yellowtail kingfish, *Seriola lalandi*, continued, and over 350 had been recaptured, including some adult fish which had travelled considerable distances.

Estuarine Fin Fish

The study of the recreational and commercial fisheries of the Sydney estuary was completed and copies of the report made available to the public. Monitoring of the fish abundance in Sydney estuary will continue until the end of 1985.

The Clarence River Commercial Fishermen's Co-operative, the Clarence River Amateur Fishermen's Association and the Yamba Chamber of Commerce expressed concern about an alleged decline in fish catches and the persistence of the fish disease, red spot, in the Clarence River. The Minister of Agriculture appointed a biologist during 1984 to investigate these issues. Investigators at the Regional Veterinary Laboratory, Wollongbar, were studying the lesions in fish and the possible causes. This work will continue, along with detailed studies of fish biology and environmental features of the rivers where this disease occurs.

The Lake Conjola and Lake Berringer estuary, representative of the south coast estuaries, supports commercial and sport fisheries, a variety of fish species and a growing tourist industry. Because competition for fish was anticipated to increase between the fishing groups, information was being obtained about catch, effort, species composition and biological data on the fish and fisheries in the lakes. The results will help determine whether further restrictions are necessary to ensure an equitable sharing of resources.

Oysters

A statewide review of oyster leases was being held to identify leases over non-productive ground. Lessees of non-productive ground were invited to surrender their leases, with a review process for those who wished to retain them. As far as possible, non-productive ground will be returned to public use and reserved from further leasing. A clean-up of untidy and derelict leases was being undertaken using funds from the Commonwealth Employment Programme, and where lessees could

be identified they were billed for the service. These programmes will improve the appearance of many areas and will return non-productive ground to public use while maintaining productive commercial areas.

Use of hatchery spat does away with the traditional time consuming methods of stock collection using natural spawning, but necessitates tray culture. Brackish Water Fish Culture Research Station, Port Stephens, continued experimental production of hatchery spawned and reared oyster spat. Although production was limited due to insufficient supplies of seawater, algae and water heating facilities, over 100 000 spat were provided to oyster farmers and there was a backlog of orders for 2 500 000 spat.

Commercial trials were very successful and participating oyster farmers were enthusiastic. Many seemed prepared to move into the system as soon as spat become readily available. Plans were being prepared for a new oyster hatchery.

Nutrition research concentrated on developing microparticulate diets for oysters, crustaceans and fish, to provide complete artificial diets for the larval stages of these animals. If this can be achieved, the cost of hatchery production would be greatly reduced.

Other Molluscs

A management plan was being developed for the abalone fishery in conjunction with the Abalone Divers' Association. An interim plan was in operation, and 59 divers were licensed to collect abalone. The number of divers was based on economic analysis of the fishery, and included issues such as a size limit, transferability and divers' health.

Short term management goals for the abalone fishery were identified and a government/industry management discussion group formed which met four times during the year. A workshop on the medical aspects of safe diving was held for commercial divers at Eden in February. Research effort was directed at accurately measuring recruitment levels of abalone so that an optimum long term population size can be determined. Sampling

revealed a low number of three year olds, which could result in a total catch decrease next year when this year class is recruited to the fishery.

Areas of Botany Bay and Merimbula were closed to the collection of cockles by recreational fishermen, and monitoring of recovery rates in the heavily fished areas was in progress. After eight months, areas within the closures showed no recovery, although recruitment occurred inside and outside the area. A Newcastle-area survey of pipi stocks showed no over-fishing, and recruitment of juveniles was occurring in all areas from Anna Bay to Newcastle.

Catches of scallops fell from 2800 tonnes in 1981-82 to 1320 tonnes last year and to about 210 tonnes in 1983-84. Monitoring showed no large spat falls after the huge one in 1979-80, and the scallop population had returned to its normal low level. Such large recruitment fluctuations are typical of scallops. Tagging of scallops to determine growth, mortality and movement rates was commenced, and initial recaptures indicated fast growth, high natural mortality and limited movements.

Marine & Estuarine Crustaceans

Two farming trials were conducted in a 1 ha pilot prawn farming pond with small prawns collected from the Clarence River system and grown to a market size. In one trial, unmarketable school prawns (1.8 g average weight) were grown to 6.5 g in 12 weeks with a survival rate of more than 70 per cent, and a total harvest of 950 kg. Experimental studies on artificial prawn diets and optimum stocking densities and water exchange rates were continued. However, considerably more economic and biological research is needed to predict the economic viability of prawn farming.

Preliminary studies of the uses of two carid prawn species as a food product started in conjunction with a commercial company. Percentage meat recovery was determined using an automatic peeling machine and compared to hand peeling. Storage trials and development of a visual assessment scoring system commenced and will be extended through 1984-85.

Work started on a crab culture programme in January 1984 to investigate techniques for breeding, larval rearing and growing out the edible mud crab, *Scylla serrata*, and so determine its potential for commercial culture in New South Wales.

Successful procedures were implemented that maintain broodstocks and consistently induce spawning and hatching to provide "seed" crabs. The procedures used closely controlled recirculating seawater systems, and simple surgery to manipulate the crabs' reproductive cycle. Experiments showed that the quality of food and rearing water are critical to survival of the newly hatched, free-swimming larvae.

Freshwater Fin Fish

Gaden Trout Hatchery, Jindabyne, produced 1 461 000 ova and fish (rainbow, brown and brook trout, and Atlantic salmon) which were liberated or donated to fishing clubs from 2 075 000 ova laid down. This was an increase of 48 per cent compared with 1982-83 and reflected the improved water conditions following the breaking of the drought.

Dutton Trout Hatchery, Ebor, liberated or donated to fishing clubs 58 000 rainbow and brook trout ova and fish.

Inland Fisheries Research Station, Narrandera, produced 364 500 golden and silver perch and Murray cod, and liberated 314 000 of these in dams and reservoirs. The remainder were sold to fishing clubs. Production was disappointing due to unfavourable seasonal conditions and problems with old infertile brood stock.

Research into the artificial breeding and larval rearing of golden perch, silver perch and Murray cod was reduced at Narrandera. The successful techniques already developed were being used by at least 10 commercial or angling club/council hatcheries in New South Wales, Queensland and Victoria.

Research was developing techniques for artificially breeding two rare native species, trout cod and Macquarie perch.

The Brackish Water Research Station, Port Stephens, produced 42 000 Australian bass fingerlings. Fingerlings were released into farm dams and small impoundments in

the Hunter Valley as part of the research programme into growth and survival of liberated fingerlings.

Approval was given during 1983 to establish a fish hatchery at the Agricultural Research Station, Grafton, for breeding and stocking of the endangered eastern freshwater cod, *Maccullochella nov. sp.* Funds were made available from the Commonwealth Employment Programme for construction of ponds and a hatchery building to be completed by December 1984. A biologist will be located at the hatchery towards the end of 1984.

The Gaden hatchery was re-opened to visitors in March and plans were announced for the construction of a new visitors' centre. Funds were made available under the Commonwealth Employment Programme for installation of new fibreglass raceways, for landscaping of the surrounds and for provision of picnic facilities. These programmes should be completed by mid-1985.

The Dutton hatchery was re-opened to tourists in December 1983, and provision of a new visitors' centre was announced in March 1984 with construction to start in 1984-85.

Work started on a 51 ML off-stream storage to increase the hatchery's watersupply. When completed in 1985, the storage will act as an emergency drought supply.

At Narrandera, guided tours were re-instituted, an advisory officer (fisheries) was appointed, and construction started on the John Lake Centre which was scheduled for completion by early September 1984. The Centre, which commemorates the pioneering research work of freshwater biologist, John S. Lake, will be a fisheries advisory and information facility.

Freshwater Crustaceans

Logbooks were again distributed to amateur fishermen, and over 4000 crayfish were tagged by the research team. Recaptures provided information on growth, reproduction and movement. Crayfish enter the Narrandera fishery when three to four years old and attain 0.5 kg at 10 to 14 years. In cold water sites like Khancoban and Jounama Pondages, growth is much slower. Mature crayfish reproduce once each year in autumn, and females reach maturity at age six to nine years and carry their young for five to six months.

Sampling will conclude in 1984 and regulations will probably be introduced to manage the fishery in 1985. The fishery will then be monitored for several years to evaluate the effectiveness of the regulations.

A Murray crayfish resting on its back before eating its freshly shed shell (top). Salt and minerals in the old shell harden the new one.



Environmental Studies

Investigation of selected natural underwater areas as marine and estuarine reserves for scientific, conservational, educational and recreational purposes was continued. Appropriate management and conservation policies were developed and/or refined for some of these areas.

No new aquatic reserves were gazetted during the past year, but investigations continued into several future proposals and into management problems of existing reserves.

Each of the main types of marine and estuarine intertidal and subtidal habitats along the coastline of the State will eventually be represented in a system of aquatic reserves and marine parks.

Investigations into development applications in and around waterways continued. Foreshore planning policies were adopted and implemented in conjunction with the relevant metropolitan government authorities. In other areas, guidelines were being formulated to protect the aquatic environment and mangroves. One hundred and eleven estuaries containing 155 square kilometres of seagrass had been mapped.

A publication on mangrove transplanting for Earth Week 1983 was released jointly with the State Pollution Control Commission. Research continued into refining the costs of mangrove habitat restoration under varying environmental conditions. Restoration expenses are primarily labor costs at the rate of 80 trees (0.5 m high) per two person team per day.

Law Enforcement

All vacant inspector's positions were filled, and five new positions of inspector-in-training were established. Patrols were increased during the latter part of the year as staff became available, but the number of prosecutions remained about the same as last year. Full regionalisation of the law enforcement section was finalised and regional fisheries officers appointed.

Fisheries inspectors assisted at field days to explain aspects of the fish and fisheries of New South Wales. A number of officers also attended the National Fisheries school in Tasmania.



Departmental Services





ANIMAL HEALTH

Responsibility for ensuring the health and related productivity of the important species of livestock, and for controlling scheduled diseases, rested with the Division of Animal Health. The Division also supervised the 38 veterinary inspectors employed by Pastures Protection Boards.

Exotic Disease Control

Three alerts for outbreaks of exotic animal diseases occurred, the most notable being a foot and mouth disease extortion threat during January-February 1984.

A permanent operations centre for exotic disease emergencies was completed in Head Office and all regions up-dated their emergency preparedness plans.

Three departmental veterinarians gained first hand experience with exotic diseases in Indonesia, Zimbabwe and the United States of America.

Animal Disease Information System and Computerisation of Veterinary Laboratory Records.

Following completion of the feasibility study on computer requirements of the animal disease information system in 1983, a group was established to prepare software system specifications. The planning and preparation of specifications of the system was well advanced. A comprehensive integrated statewide records system to allow ready retrieval of animal disease information was planned.

Animal Welfare

The first four animal welfare codes of practice developed by the standing committee on animal welfare for the animal health committee, reported last year, were endorsed by the Australian Agricultural Council. The poultry and pig codes were subsequently endorsed by the poultry and pig industries and other codes were being developed.

The standing committee on animal welfare revised the NHMRC/CSIRO codes of practice for animals in research. The codes were incorporated into new legislation for the control of animals in research by the Department of Local Government.

Stress and Animal Production

A project to investigate physiological indicators of stress in dairy and beef cattle and sheep commenced, with the primary purpose of finding how farm animals cope with their environment. The use of cortisol levels in saliva and in milk as a measure of stress was being evaluated. A method for saliva collection without disturbing the animal was developed, and a high correlation between salivary and plasma cortisol found. There was no correlation found between milk cortisol and plasma cortisol.



MARKETING AND ECONOMIC SERVICES

Marketing Services

Primary producers' continuing needs for information on international grain markets, commodity prospects and global trade conflicts were met by regular talks by officers on ABC and commercial rural radio programmes; by publication of the *Cereals and Oilseed Digest*; and articles

in the various print media. Articles about various horticultural and intensive livestock commodity prospects were frequently published in the Department's *Commodity Bulletin*.

Seminars of bankers, grain and oilseed producers, primary producers, economic students and economic teachers were addressed by commodity experts. Officers participated in and contributed to a number of industry public inquiries and industry workshops. Monitoring of horticultural commodity markets also increased.

Economic Services

Economic analyses of a wide range of issues provided background information of New South Wales agricultural and fisheries policy making. This information was used for briefing the Minister and departmental Executive; for preparation of background papers for the Australian Agricultural Council; for preparation of submissions to State and Federal Government inquiries; and provision of policy advice to other government departments, marketing boards, statutory authorities and industry groups.

Issues examined included: tobacco stabilisation and production quota arrangements; honey stabilisation proposals; marketing arrangements for the wheat, egg and dairy industries; irrigation water management policy; policy relating to the use of agricultural land; rural adjustment; and management proposals for fisheries.

Production and Marketing Research

The Division of Marketing and Economic Services undertook applied economics research into various aspects of agricultural production and marketing that will provide specialist support for the Department's research and advisory services. Continuing studies in the production area included an examination of factors affecting wheat yield, and the economic relationship between yield and quality in wheat breeding programmes; economics of minimum and zero tillage cropping techniques;

assessment of the benefits of the Merino fleece measurement service; assessment of the effects of new technology in prime lamb production; a structural analysis of the pig and stock feed industries; the impact of alternative pig husbandry practices; and techniques for optimising irrigation water use. New studies included an assessment of the economics of declining pasture productivity; evaluation of enterprise specialisation versus mixed farming; economics of soil degradation; an economic survey of north coast beef producers; and the economics of part-time farming.

Marketing area studies included development of econometric models of the beef, prime lamb and pig meat industries. Economic evaluation of alternative livestock marketing systems, particularly electronic selling, continued. Other studies evaluated the effect of pig meat promotion, and the processing and consumption of wheat in Australia.

Three issues of *The Review of Marketing and Agricultural Economics* were published during the year.

Submissions to Inquiries and Government Business

Evidence was presented to IAC inquiries on assistance to the dairy industry, the southern blue-fin tuna industry, and the dried vine fruit industry, and on rural adjustment. The Division helped prepare departmental submissions to the New South Wales Water Management Audit, and the Commonwealth Grants Commission Inquiry into the States' tax sharing entitlements.

Farm Business Management

Regional economists and the Farm Management Adviser continued to provide information to assist primary producers make decisions according to their financial circumstances. This information is a necessary complement to that provided by the Department's technical advisory staff. It was made available to producers as written material, by personal contact (either directly or at field days and workshops), and through advisory officers.

Central Statistics Unit

The Department's integrated system of research, advisory, education and regulatory services depends on the availability of a comprehensive and up-to-date data base system. The central statistics unit continued to coordinate the collection, storage, basic manipulation and effective dissemination of agricultural and fisheries statistics.

A voluminous collection of statistical information, including all those previously kept by the departmental library and by other divisions, and statistical data from other government agencies are maintained in the unit. Work commenced to store these on the Department's Agnet computer system.

Head Office and regional departmental officers can now directly obtain required statistical information from the unit. Data extraction and manipulation will be greatly improved when computerisation is complete. The display of available statistical information in computer graphical form will provide a valuable support service for front-line advisory officers and a policy decision tool for the Executive.

Marketing Unit

A marketing strategy study conducted for the Banana Growers Federation Co-operative was endorsed by the Co-operative's board and partly implemented. Marketing research was undertaken for the Wine Grapes Marketing Board. Recommendations were made on promotional programmes, product innovation, grape price negotiations and selection of wine grape varieties. A marketing research report was completed and submitted to the custard apple sub committee of the Exotic Fruit Growers Association.

Findings from research into farmer attitudes to marketing education were being used to increase the communication of marketing ideas.

Work was advanced on an examination of alternative marketing structures for producers. The report examines partnerships, companies, cooperatives, marketing boards and marketing orders.

Research projects were started for the Australian Honey Board, the pasture seeds industry and

Shoalhaven Dairy Co-operative. Marketing advice was given to the Kiwifruit Growers Association of NSW, the Oyster Farmers and Producers Association, the Goat Milk Producers Association, the angora goat industry, the lamb industry and producers of cauliflowers and blueberries.

Market Reporting Service

The livestock market reporting service was expanded to include the Tenterfield cattle market with livestock sales at Armidale, Casino, Dubbo, Goulburn, Gunnedah, Homebush, Tamworth and Wagga Wagga. The market reporting service continued to report the fruit, vegetable and cut flower markets at Flemington; and the weekly Sydney Metropolitan retail sales of fruit, vegetables, meat and fish. The service also expanded to cover the pig sale-by-classification, other computer-based livestock selling systems and the reporting of sheepskin tender sales.

Three Community Employment Programme personnel were employed to obtain industry reaction to, and possible expansion of, the various components of the service, and to disseminate additional information to the public.

Information collected by the market reporting service was disseminated through the print media, national and regional radio broadcasts, regional television, and phone-in recorded message services. Region-specific reports were established in the MIA with other areas to follow. Market information was supplied to Seventext and other videotext networks.

Director of Marketing

A new Marketing of Primary Products Act, 1983, came into operation on 1st February 1984, repealing the 1927 Act. A new Director of Marketing took over responsibility for the Act from the Division of Marketing & Economic Services on 11th April 1984.

At the Minister's request, the Division organised a seminar at Orange for representatives of marketing boards, producer associations, rural trading organisations, and banks, to discuss the draft Marketing of Primary Products Bill.

During 1983-84 the State Electoral Office conducted triennial elections for producers' representatives to the Barley Marketing Board; Wine Grapes Marketing Board; and Oats Marketing Board. Preparatory work on these elections was carried out by the Division.

Similarly, the State Electoral Office was helped to conduct a by-election for the Murray Valley (NSW) Citrus Marketing Board, and the triennial election of producer representatives to the Grain Handling Authority. It also undertook the usual preparatory work on the forthcoming election of producer representatives to the Meat Industry Authority and to the Potato Grower's Association of NSW.

Investigations established the validity of a lemon producers petition, that lemons grown in the Murray Valley (NSW) Citrus Marketing Board's area be placed under the Board's control. The poll will be held by the State Electoral Office in July 1984.

In May, the Oilseeds Marketing Board requested that the Agricultural Marketing Finance Agency be constituted. This was approved by the Governor on 30th May 1984, and took effect from 1st June 1984.



New mango varieties were being evaluated in the North Coast Region, particularly for disease resistance.

RESEARCH SERVICES

The Department is by far the largest research organisation in the New South Wales public service. It conducts applied research for all sections of agriculture and fisheries, much of it in the field and at sea, but most originates from the following research institutions:

- | | |
|--|--|
| Head Office, McKell Building,
Haymarket | Brackish Water Fish Culture
Research Station, Port Stephens |
| Biological and Chemical Research
Institute, Rydalmere | Regional Veterinary Laboratory,
Armidale |
| Central Veterinary Laboratory &
Agricultural Engineering Centre,
Glenfield | Agricultural Research & Advisory
Station, Glen Innes |
| Fisheries House, Wynyard | Horticultural Research Station,
Gosford |
| Nutrition & Feeds Evaluation
Unit, Glenfield | Horticultural Postharvest
Laboratory, Gosford |
| Regional Veterinary Laboratory,
Glenfield | Animal Breeding & Research
Unit, Armidale |
| Agricultural Station, Seven Hills | Agronomy Research Unit, Scone |
| Food Research Laboratory, North
Ryde | Agronomy Research Unit,
Maitland |
| Hawkesbury Agricultural Research
Unit, Richmond | Dutton Trout Hatchery, Ebor |
| Agricultural Research Centre,
Wollongbar | Agricultural Research Centre,
Trangie |
| Regional Veterinary Laboratory,
Wollongbar | Rangelands Management Research
Unit, Cobar |
| Agricultural Research & Advisory
Station, Grafton | Agricultural Research &
Veterinary Centre, Orange |
| Tropical Fruit Research Station,
Alstonville | Regional Veterinary Laboratory,
Orange |
| Agronomy Research Unit, Taree | Agricultural Research & Advisory
Station, Condobolin |
| Agricultural Research Centre,
Tamworth | Agricultural Research Station,
Bathurst |
| Agricultural Research Station,
Narrabri | Agricultural Research Station,
Cowra |

ADVISORY SERVICES

The Department provided advice to all sectors of the community. Full-time farmers and fishermen received production and marketing advice that allowed them to produce better quality produce and seafood, and to receive a reasonable price. Consumers were told of the best ways to select and prepare food for the table. Home gardeners and amateur fishermen were also given advice that helped make their hobbies more enjoyable.

Garden Advisory Service

The Garden Advisory Service attended to 24 872 inquiries (up 20 per cent) which involved 21 564 telephone and 2550 personal inquiries. "Music on hold" telephone equipment was installed, with favourable public response and fewer calls lost.

The purchase of additional soil testing equipment enabled salinity and texture assessments to be performed as well as pH tests.

Thirty seven people took part in a W.E.A. course on home gardening conducted by the Garden Advisory Service. One of the garden officers began monthly appearances as "Mrs Leafy" on ATN Channel 7's "Romper Room".

Primary Products Promotion

The primary products promotions unit continued actively promoting agricultural and fisheries produce to the general public using all media.

Major promotions were the launching of the 1984 apple and pear season; the Royal Easter Show; the statewide avocado recipe development competition; and the launching of "The Fresh Vegetable Cookbook", which was written by Vo Bacon and produced in association with the Sydney Farm Produce Marketing Authority.

A further \$300,000 was allocated from miscellaneous sources, including the Mushroom Growers Association; the Central Coast Citrus Growers Association; Water Research Foundation of Australia Ltd; National Energy Research Development & Demonstration Council; Horticultural Stock & Nurseries Act Account; Apple & Pear Research Foundation; and donations from various agricultural companies.

Biometrical Branch

Major contributions were made to the design of variety trials and to the analysis of data from them and to the lay-out of field trials. Further progress was made in the analysis of sequences of observations, which has application to long-term agricultural experiments.

Methods were developed for the classification of cropping land according to crop, using remote-sensing data. Theoretically optimum procedures had to be modified considerably for use with Landsat data because of inadequate computing facilities for this type of work.

Agricultural Research & Advisory Station, Temora
Gaden Trout Hatchery, Jindabyne
Artificial Stock Breeding Centre, Berry
Pasture Research Unit, Berry
Pasture Research Unit, Canberra
Dairy Demonstration Farm, Bega
Agricultural Research Institute, Wagga Wagga
Regional Veterinary Laboratory, Wagga Wagga
Agricultural Institute, Yanco
Agricultural Research & Advisory Station, Dareton
Viticultural Research Station, Griffith
Murray Valley Research Unit, Deniliquin
Inland Fisheries Research Station, Narrandera
The main financial support for research came from Consolidated Revenue, and about eight per cent from rural industry research grants. Some are detailed below:

	1982-83	1983-84
	\$	\$
Commonwealth Rural Industry Trust Accounts		
Australian Chicken Meat Research Committee	32,070	21,946
Australian Dairy Research Committee	17,753	20,260
Australian Meat Research Committee	648,388	803,721
Australian Pig Industry Research Committee	69,433	73,841
Barley Industry Research Committee of NSW	69,455	53,247
Barley Industry Research Council	24,266	29,393
Cotton Research Committee	55,300	197,109
Dried Fruits Research Committee	35,135	56,678
Honey Research Committee	17,300	17,590
Oilseeds Research Committee	94,069	80,280
Poultry Research Advisory Committee	21,600	35,826
Tobacco Trust Account	74,330	35,240
Wheat Industry Research Committee of NSW	508,882	493,019
Wheat Industry Research Council	401,336	380,014
Wool Research Trust Fund	370,184	491,695
Other Major Grants		
Commonwealth Special Research Grant	40,503	49,212
I.R.E.C. (Rice Industry Contributions)	248,300	268,503
Rural Credits Development Fund	83,360	204,302
Swine Compensation Fund	80,000	171,250
Fishing Industry Research Trust Account	83,150	93,822
	\$2,974,794	\$3,572,839



The Department continued to provide home gardeners and amateur fishermen with valuable advice.



Many of the Department's displays, housed in the new mobile display unit, were seen at major field days and agricultural shows throughout the State.

Mobile Display Unit

A mobile display unit designed by officers of the Department proved a very effective medium for professionally displaying services and providing information to clients throughout the State. The unit is 10.5 metres long and is hauled by a prime mover with a truck body used as an amenity and client interview room.

The unit was effectively used at all of the major field days and at a variety of country shows. Departmentally designed and produced display material installed in the unit was added or replaced to suit each event.

TECHNICAL SERVICES

Analytical Methods

The Olsen method for analysing available soil phosphate was automated, and became the basis of the soil phosphate method used by the soil testing service. An analysis procedure on a continuous flow analysis system was used to overcome the precipitation problem associated with this method when analysing acid soils.

Research and advisory activities for all professional officers, 1983-84

	Region 1	Region 2	Region 3	Region 4	Region 5	Head Office and statewide establishments	State total
Agfacts	19	79	14	69	31	113	325
Press articles	568	1 353	366	1 835	850	130	5 102
Contributions to newsletters	294	535	95	317	231	93	1 565
Original radio broadcasts	432	1 168	363	1 680	568	152	4 363
Original TV programmes	53	98	46	166	345	30	738
Field days held	230	398	149	448	401	58	1 684
Meetings held	719	845	202	957	748	545	4 016
Conferences and schools held	260	316	47	213	194	279	1 309
Agricultural shows	61	92	34	101	67	17	372
Total farm visits	10 616	15 795	2 867	14 302	11 946	2 634	58 160
On-farm trials	223	527	193	570	788	110	2 411
Papers and notes published in scientific journals	46	109	16	57	40	130	398
Books, book chapters and post-graduate theses	6	12	2	8	10	26	61
Contributions to proceedings of societies	77	170	40	84	95	150	616
Regional and district bulletins	136	347	60	238	209	193	1 183

Improved extraction procedures for the estimation of the rubber content of guayule were developed, and quantitative extraction was confirmed by nuclear magnetic resonance of plant tissue at various stages of extraction.

Enzymatic methods of analysis were developed for the determination of low-mixed linkage B-glucan to screen barley breeding.

Tentative leaf standards were developed for assessing the nutrient status of kiwifruit. The use of these standards will permit more effective use of fertilizers and result in improved fruit quality.

Forensic Chemistry

The Department continually received soil samples from the NSW Police for study and analysis in relation to criminal cases. In one instance involving the alleged cultivation of Indian hemp at Kundabung, chemical analysis showed that, unlike surrounding bushland, there were very high phosphorus levels in soil samples taken from the cultivated area. An officer from the soils and land use studies section was required to give evidence at the Port Macquarie court hearing.

Pesticides Registration

To keep departmental officers up-to-date and thus able to give the best advice to clients, the pesticides registration section provided them with details on new chemicals; on major new claims for chemicals; and on pesticide orders issued under the Pesticides Act, 1978. The section also provided information about all labels registered under the Act to Queensland Agricultural College for inclusion in the publication *QAC Peskem*. Details of pesticides registrations are in Appendix II.

Animal Health Diagnostic Services

There was a 19 per cent increase in the number of consignments of specimens received at the Department's veterinary laboratories. In addition to 25 350 consignments of specimens, 1 800 000 brucellosis blood samples were collected as part of the brucellosis eradication campaign. Details of the various submissions are given in Appendix 1.



A total of 160 escort bees were dissected at the Biological and Chemical Research Institute to detect internal parasitic mites which cause Isle of Wight disease, but none were found.

Plant Health Diagnostic Services

During the year, 2706 insect and mite specimens were submitted to the entomology branch at the Biological and Chemical Research Institute for identification, and 6315 specimens were added to the insect and mite collection.

Architectural and Construction Work

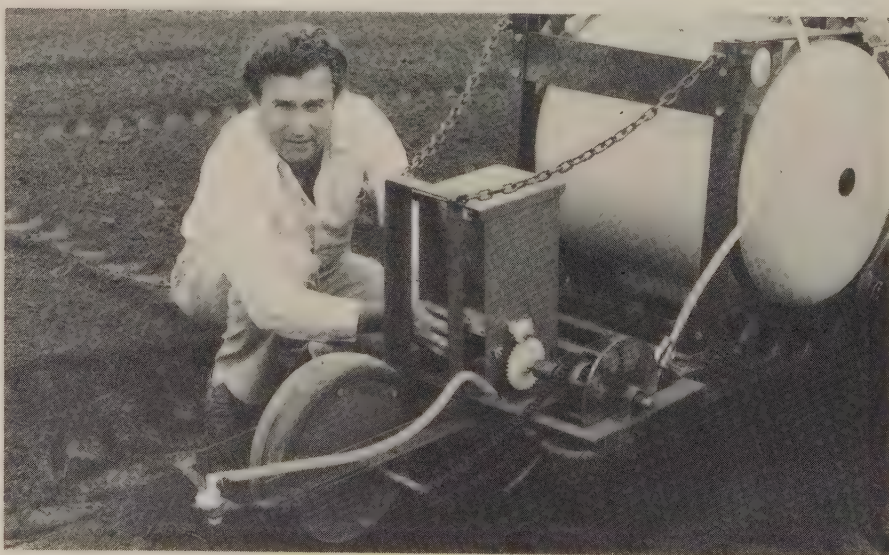
A new cereal quality testing laboratory was built at the Tamworth Agricultural Research Centre, and officially opened by the Premier on 2nd September 1983.

Construction started on a new \$2,000,000 chemistry laboratory building at the Biological and Chemical Research Institute, Rydalmere, scheduled for completion within 12 months.

Other major building works started included the construction of a short course centre at the Yanco Agricultural Institute; new offices at Coonamble; a new chemical store at the Biological and Chemical Research Institute, Rydalmere; and the relocation of the administrative building from Leeton Agricultural Research Station to the Yanco Agricultural Institute.

Energy Conservation

The Department's Energy Management Programme moved to the second phase of a three stage programme and two major contracts worth about \$140,000 were let and completed. The major initiative was the installation of the computerised automatic load management system, designed by the Department's plant engineer specifically to cater for the varying electrical needs and operations of the Department's major institutions. The system was installed at eight departmental institutions and monitored from Head Office.



AGRICULTURAL ENGINEERING

Conservation Farming Technology

A long term tillage systems comparison trial at Condobolin showed that wheat yields for 1983 were higher for all plot systems when soil was worked deeper. The increased yield would repay the extra cost and energy of deeper tillage. Trials examined the performance of scarifier point types, sizes and positions, and provided information suited to the hard-setting soils of the central western division.

Two new seeders and components developed by the Department were provided to regional machinery officers to evaluate and demonstrate seeding techniques for untilled soils and heavy crop residues.

Tractor Operational Factors

Tractor operational factors were further examined. The practice of ballasting to the maximum allowed was shown to be applicable only to tractors operating on firm surfaces at low speed, when it is likely to shorten tractor transmission life. Vertical loading effects on tractor reliability were the subject of an on-going study.

Tractor Roll-Over Protection Structures (ROPS)

The Machine Safety Regulations for tractors manufactured before 1974 were brought into effect on 1st May 1984, with the Department of Industrial Relations responsible for initiation and enforcement. Engineering branch personnel provided an Agfact and news releases about the new Regulations, but many farmers were unprepared and confused. Some manufacturers were

unable to provide immediate delivery of ROPS units, and to comply with the law, owners must have evidence of having placed orders before 1st May 1984. The Department completely endorses the legislation in the interest of tractor operator safety.

Efficient Energy Use

Reflecting the decline in inquiries about renewable fuel production, emphasis on rural energy was switched towards the more efficient use of energy.

Diesel fuel quality required continued attention as farm diesel fuel quality has deteriorated and farmers need advice on how to cope with the more waxy fuel.

A National Energy Research Development & Demonstration Council grant was awarded to the Department to study opportunities to reduce energy in tillage operations in Australia. The short term assignment was greatly helped by the participation of Dr Donald C. Erbach, a distinguished engineer from the USDA-ARS at Ames, Iowa. A national survey was completed, and an analysis made of present energy usage levels in agriculture and of the potentially realisable energy savings in tillage. Potential annual savings of 200 000 000 litres of fuel for tillage were shown.

The prototype ropewick chemical applicator machine for row crop production, called Clean-up, was manufactured by Sherwood's of Bundanoon. The company successfully tendered for a licence to

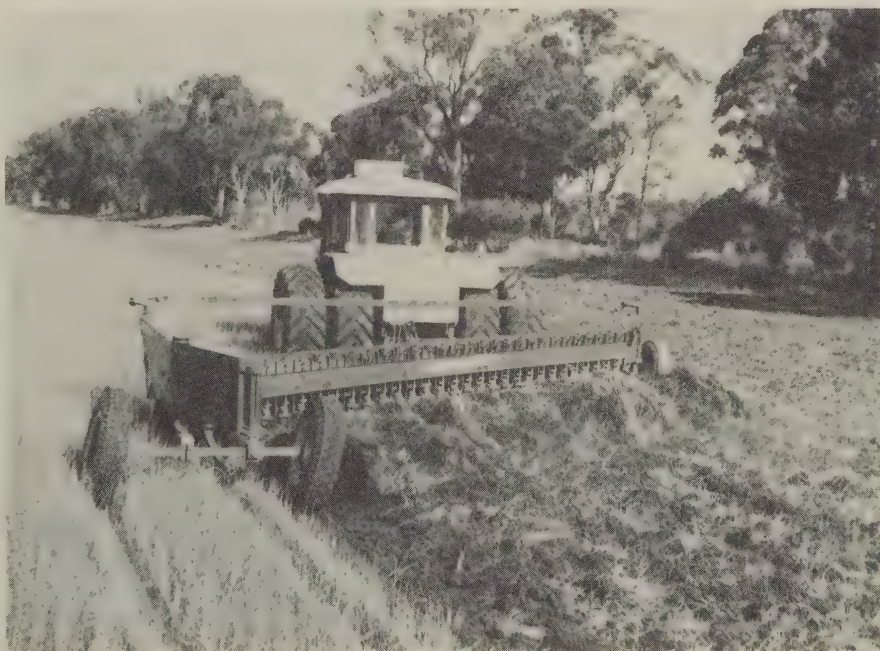
commercially produce the Department's design and had sold 30 units by year's end.

The record grain crop focussed attention on the need for information on all types of grain storage. The Grain Handling Authority and the Department further developed and demonstrated plastic-covered bunkers as a viable on-farm storage method. Standardised designs were developed, and a video produced and widely shown at conferences, field days and on regional TV before the 1983-84 harvest.

AGRICULTURAL EDUCATION

Orange Agricultural College, which became a college of Advanced Education in 1973, became fully autonomous on 1st January 1984. Full-time agricultural education in the Department was then confined to C.B. Alexander Agricultural College, Paterson, and Murrumbidgee College of Agriculture, Yanco.

Disc ploughs came to the forefront as a way of handling the 1983 wheat stubbles and summer weed growth.





Murrumbidgee College of Agriculture

Construction started in April 1984 on a short course centre, extensions to the existing library and a farm machinery repair and maintenance workshop for training students. These facilities will be completed in March 1985 at a cost of \$1,300,000 and will benefit full-time and short course students, and community groups.

The short course centre will have seven rooms for conferences, seminars, lectures and tutorials. Computer training facilities will be an important feature of the new building. Library extensions will incorporate modern library information services and self-directed learning resources.

Community Employment Programmes announced in March 1984 provided for the construction of a large welding/farm fabrication instruction building, for the renovation of two accommodation blocks, and for the construction of a community sports complex. The three projects costing \$288,000 complement the short course centre.

College staff cooperated with regional advisory officers and the McMillan Rural Studies Centre (Victoria) to develop a Trees on Farms short course and home-study programme that will be offered to producers throughout the Murray and Riverina Region during 1984.

Murrumbidgee College continued as a specialist irrigation training centre by providing four, week-long landforming courses for irrigation farmers, a five-week in-service course

for departmental agronomists, and irrigation training for its full-time students.

C.B. Alexander Agricultural College

More than 600 students enrolled in the Department's home study courses in Farm Management and Farm Office Management in 1984.

Student applications continued to be strong with enrolments of 80 in the Certificate of Agriculture course and 49 in the Advanced Certificate, giving a total enrolment of 129 students (95 male and 34 female).

The Dairy Apprenticeship Course (part-time) showed a marked improvement with a total of 20 students (13 in first year and 7 in second year), as compared with a 1983 enrolment of 11 students.

The applied practical nature of the courses was recognised by the agricultural industries — ninety per cent of the Tocal Advanced Certificate in Agriculture students secured employment before the end of the academic year. Other employment opportunities were offered for which no suitable applicants were available.

A number of successful activities were conducted in continuing education for farmers, and the College combined with the Department's district office and industry representatives to conduct a very successful Field Day for Small Farms attended by over 7000 people over two days.

PUBLICATIONS AND INFORMATION

At the beginning of the financial year, the Government Printer installed a two-man typesetting and art assembly unit alongside the publications and information group in the McKell Building. The facility greatly speeded up the production of shorter Agfacts and enabled an expansion of rapid services for other items, such as display artwork and printing of other publications, certificates, and stationery. Plans were made to expand this service.

Some 300 Agfacts were produced during the year, including 271 first editions. By year's end, 670 different titles had been produced, many in more than one edition, and an increasing proportion in colour. With an established regular throughput of Agfacts, it will be possible to offer a subscription service early next year whereby every title published is direct-mailed to the subscriber's office or home.

Other publications produced during the year included "Poisonous Plants: Handbook for Farmers and Graziers" by E.J. McBarron, a 150-page book published for the Department by Inkata Press; "The Fresh Vegetable Cookbook" by Vo Bacon, a 144-page book published for the Department by Regency Press; and a number of posters and publications to serve special purposes. One of these, a sheep reproduction calendar, is an adaptable monthly management guide likely to be a forerunner for similar aids to good farm management.

Sales of publications amounted to \$145,512.

Farmer newsletters continued to increase in number; details of the output of those and other publications are included in the table under Advisory Services.

LIBRARY SERVICES

Acceptance of technological change continued to grow, and the role of the librarian was changing rapidly. Emphasis on the collector/custodial role was falling, and network members concentrated on organising a service in their regions and on specialising in particular information gathering techniques.

Further cooperation with other institutions rationalised personnel use and maximised their input.

Initiatives being pursued were:

- The establishment of an Agricultural Resources Exchange Association with Riverina College of Advanced Education which collects surplus publications from agricultural libraries, makes them into useful sets and offers them to libraries in Australia and developing countries.

The parthenium weed awareness campaign in the New England area led to the location and destruction of many infestations of the weed.

- The integration of ABOA (Australian Bibliography of Agriculture) into the standard funding pattern of interstate activities.

New programmes within the Department consisted of a planned "Bibliography of Publications since 1890", restricted overseas exchanges of publications on microfiche, and the introduction of a library manual of all locations and the library resources held at each.

The growth of computer resources available within the Department facilitated information transfer over any distance.

AGRICULTURAL BUREAU

Membership remained at just over 2000 in 67 branches statewide. About 21 000 people attended the 426 branch activities.

The annual conference, on the theme of "Stabilisation — Friend or Foe?" was opened by the Federal Minister for Primary Industry, the

Hon. John Kerin, MLA. The programme included marketing authorities leaders such as Sir William Gunn.

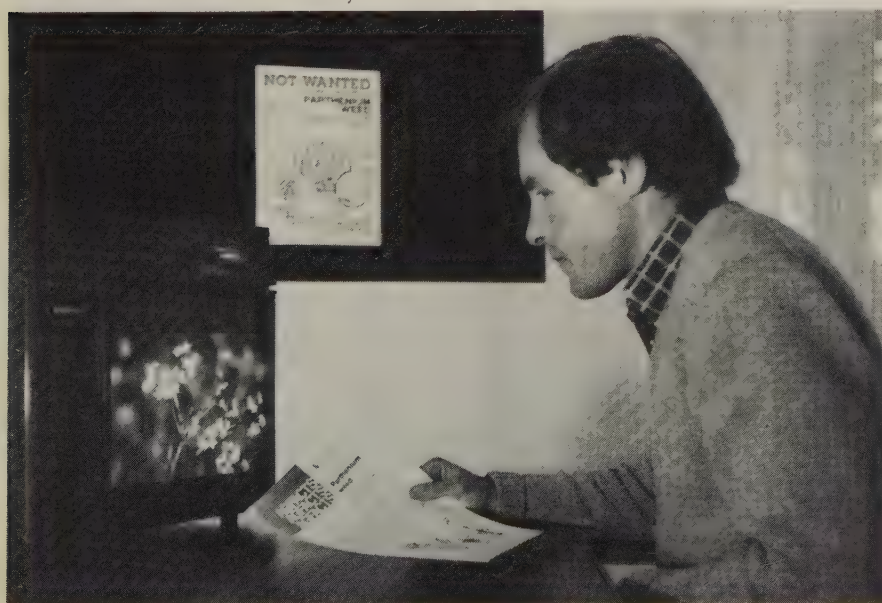
The major project for the year using an Adult Education Board grant was "Post Drought Strategy", about which individual branches conducted special seminars and field days.

RURAL YOUTH

The reorganisation of the administrative structure was completed, and all changes will be presented to the next State Conference for ratification. Junior and senior sections will come together in one organisation under a State Council with much greater responsibilities and powers to direct the organisation.

A government grant of \$15,000 was provided for restructuring and for the implementation of new statewide programmes more suitable for modern youth. Branches had increased membership to almost 2000 in 78 groups statewide.

The 50th Showcamp at the Royal Easter Show was a major success with 80 members attending. In conjunction with the Royal Agricultural Society, Rural Youth was responsible for setting up and staffing the animal nursery which attracted many thousands of school children.



TRAINING

Communications skills workshops were held at Orange Agricultural College in July and December. Forty research officers and 48 advisory officers received training in speaking, writing and using news media.

REGULATORY SERVICES

Regulatory Function of the Department

The Department had a basic role in:

- the control or eradication of plant and animal diseases and pests;
- ensuring high quality in agricultural and fisheries products, especially foodstuffs, and aids such as stock medicines, seeds and pesticides;
- maintaining standards of conduct in areas of activity associated with agriculture and fisheries; and
- the prevention of entry of exotic plant and animal diseases and pests.

These powers and responsibilities were vested in the Department through various Acts and their Regulations.

Regulatory Legislation

The legal branch coordinated the preparation of legislation (including amendments to existing statutes), prepared informations for prosecution, and appeared on behalf of the Department in defended cases.

Officers of the legal branch also conducted legal training seminars throughout the State and at Head Office to assist staff in their regulatory activities under various Acts.

The following general activities were undertaken under State Acts: informations prepared, 84; proclamations, 20; notifications, 7; gazettal of appointments, orders and miscellaneous notices, 172

Main Acts Concerned with Regulatory Activities

The Department's regulatory activities were carried out under the following main Acts:

State Acts: Agricultural Holdings Act, 1941; Agricultural Scientific Collections Trust Act, 1983; Apiaries Act, 1916; Banana Industry Act, 1969; Canned Fruits Marketing Act, 1979; Cattle Compensation Act, 1951; Chicken Meat Industry Act, 1977; Dairy Industry Act, 1979; Dried Fruits Act, 1939; Egg Industry Act, 1983; Farm Produce Act, 1983;

Fisheries and Oyster Farms Act, 1935; Fertilizers Act, 1934; Grain Handling Act, 1954; Horticultural Stock and Nurseries Act, 1969; Marketing of Primary Products Act, 1983; Meat Industry Act, 1978; Noxious Insects Act, 1934; Pastures Protection Act, 1934; Pesticides Act, 1978; Plant Diseases Act, 1924; Potato Growers Licensing Act, 1940; Poultry Processing Act, 1969; Prickly Pear Act, 1924; Registration of Stock Brands Act, 1921; Seeds Act, 1982; Stock (Artificial Insemination) Act, 1948; Stock (Chemical Residues) Act, 1975; Stock Diseases Act, 1923; Stock Foods and Medicines Act, 1940; Swine Compensation Act, 1928; Sydney Farm Produce Market Authority Act, 1968; Tobacco Leaf Stabilisation Act, 1967; Veterinary Surgeons Act, 1923; Wheat Marketing Act, 1979; Wine Grape Processing Industry Act, 1979.

Commonwealth Acts: *Quarantine Act* 1908-73; *Export Control Act* 1982; *Fisheries Act* 1952.

Spot checks by regulatory officers ensure the high quality of produce.



Summary of Legislative Activities

The following legislation was assented to:

Acts	
Agricultural Scientific Collections Trust Act, 1983	
Dairy Industry (Amendment) Act, 1983	
Marketing of Primary Products Act, 1983	
Regulations	
	No. of Amendments
Agricultural Holdings Act, 1941	1
Cattle Compensation Act, 1951	1
Dairy Industry Act, 1979	1
Dried Fruits Act, 1939	2
Egg Industry Act, 1983	2
Farm Produce Act, 1983	4
Fisheries and Oyster Farms Act, 1935	9
Grain Handling Act, 1954	2
Marketing of Primary Products Act, 1983	6
Meat Industry Act, 1978	4
Noxious Insects Act, 1934	1
Pastures Protection Act, 1934	3
Seeds Act, 1982	1
Stock (Artificial Insemination) Act, 1948	1
Stock Diseases Act, 1923	1
Total 39	

Plant Diseases Act, 1924

Power under the Act was used to successfully fumigate the City Hotel, Kent Street, Sydney, to eradicate an infestation of *Cryptotermes brevis*, the world's worst drywood termite.

A Proclamation declared European wasp, *Vespula germanica*, and Argentine ant, *Iridomyrmex humilis*, as pests under the Act. This gave inspectors the right to enter and search for these pests and to serve notices for their control.

Populations of Queensland fruit fly, *Dacus tryoni*, were heavy in coastal areas. Despite this pressure, whole town baiting treatments kept the towns of the irrigated horticultural areas along the Murrumbidgee and Murray Rivers free from this pest.

Quarantine Act 1908-73 (administered on behalf of the Commonwealth)

The successful integration of the animal and plant quarantine inspection services in New South Wales resulted in more efficient and more economic quarantine surveillance.

Collection of fees for certification for export of all mammals, birds, bees and fish started on 1st July 1984. These fees were instituted under the *Quarantine Act* by the Australian Department of Primary Industry in response to the Federal Government policy that 50 per cent

of export certification costs should be recovered from the exporters.

From 21st February 1984, new Quarantine (Animals) Regulations allowed live fish to only be imported if they underwent a 14 day quarantine period in Australian premises approved and registered for the purpose.

A system of approval of export fish premises was developed to ensure that fish exported to Australia are free from disease, are packed and documented in an approved style and to required standards, and include no extraneous matter, plant material, pests or unauthorised species of fish.

Horticultural Stock and Nurseries Act, 1969

A nurseryman was successfully prosecuted under this Act for false labelling of nursery stock.

Stock (Artificial Insemination) Act, 1948

New regulations proclaimed on 6th April 1984 required triennial renewal of all Certificates of Competency. This allowed for greater control of activity in the artificial breeding industry.

Pesticides Registration

The pesticide registration section was responsible for the administration of

the Pesticides Act, 1978, and allied matters.

The Act controls the sale, supply, possession and use of pesticides; and provides for the registration of pesticides, the approval of containers (for registered pesticides), and the registration of labels.

Amendments to the Pesticides Act, 1978 that will exercise additional controls over aerial pesticide application were well advanced.

Officers of the section gave a number of lectures on the Pesticides Act to various farming, horticultural and pest control operator groups during the year.

Regulatory Staff

Some officers combined regulatory work with other activities and special groups were appointed for specific regulatory functions, for example: brucellosis eradication; fisheries inspection; cattle tick control; plant disease regulations; quarantine inspection for imported produce; and quality inspections for exports.

The following table summarises departmental staff who were inspectors under an Act and who were directly involved in regulatory work. Many of the professional staff had a dual advisory regulatory or a research/regulatory function. Regulatory work was a major activity in four divisions.

Staff involved in regulatory work							
	Agric. Services	Animal Health	Animal Prod.	Plant Indus.	B&CRI	Fisheries	Total
Professional	5	54	62	4	4	—	129
Inspectors	9	623	—	155	—	90	877
Total	14	677	62	159	4	90	1006



ADMINISTRATION

Finance Branch

A management plan for the introduction of programme budgeting was completed.

The possible streamlining of requisitioning and purchasing procedures was reviewed.

Administration and accounting for the sale of inland angling licences and emergency tail tags was decentralised to the regions.

A new accounting system for the Graham Park Breeding Centre was designed and implemented to provide more effective management information.

The finance branch issued 31 352 cheques for \$159,067,052 and 32 697 receipts valued at \$38,514,198 to the end of the 1983-84 financial year.

Several sections of the chart of accounts were reviewed to provide improved cost information.

Finance

The 1983-84 budget was presented in the traditional line format, but a supplementary set of figures detailed the 1983-84 allocations and expenditure in a programme format.

Overall, the Department spent \$101,836,000 from the Consolidated Revenue Fund, against an original budget allocation of \$99,628,000. The difference was supplemented by Treasury to cover costs of award increases and other justified expenditures, thus giving a balanced budget.

Income to the Department from fees for services rendered and from miscellaneous receipts was \$14,937,000.

Management Services Branch

The Branch changed the emphasis of its work from manual systems to computer systems and development and technical support.

The branch started setting up the Department's Agnet computer network. Tenders were called for the supply and maintenance of a computer system to replace the existing network. The contract was awarded to PRIME Computers for nine computers which will be installed by the end of 1984. To make computing facilities accessible to all officers, a tender will be called for microcomputers to act as terminals and as self-contained computers.

The branch processed the 1982-83 Management Information System which analysed the work carried out by 1500 research and advisory staff.

Work started on the computerisation of staff establishment records.

All information about properties owned or controlled by the Department was placed onto a computerised system.

Staff Branch

Programming for the computerisation of all staff records was completed and data entry commenced.

Equal Employment Opportunity Coordinator

During the year, the Coordinator briefed all Regional Boards of Management on equal employment opportunity.

The Commonwealth-assisted work therapy scheme was introduced to help disabled people gain permanent employment.

The Coordinator provided support and guidance to the Department's spokeswomen and conducted a one-day workshop for 12 regional and Head Office spokeswomen.

Personnel Officer (Counselling)

The Personnel Officer visited 41 departmental units to discuss staff problems. About 126 officers were counselled on problems ranging from unsatisfactory work performance to health difficulties.

The Personnel Officer worked closely with the Department of Youth and Community Services and Community Health Centres to find solutions to staff problems.

A staff appraisal scheme was set up that allowed administrative and clerical staff to regularly review their work performance. The Personnel Officer prepared a training manual for the scheme and conducted workshops for 38 staff at Yanco and Wagga.

A staff assistance network was introduced that helped staff solve work and personal grievances, and 10 liaison officers were trained to counsel staff.

Job Creation Schemes 1983-84

The Department of Agriculture participated in a number of job creation and training schemes. These were the Wage Pause Employment Programme (WPEP), National Employment Strategy for Aboriginals Scheme (NESA), Special Youth Employment Training Programme (SYETP), the State Youth Corps (SYC), Community Employment Programme (CEP), and Youth Employment Scheme (YES).

The Wage Pause Programme allocated \$2,100,000 for three projects.

- Enhancement of the Department's research and educational complexes in the north coast, Hunter, Gosford, Sydney and Illawarra areas. The project provided employment for 47 people in March/April for a period of 16 weeks. A further 47 people will be employed for 16 weeks at the end of the first intake.
- The Community Advisory Services Project was used in the Sydney, Hunter, Illawarra and north coast areas. It provided employment for

71 people for 18 weeks, and then a further 71 people were employed for 18 weeks. The project was designed to increase the effectiveness of the Department's advisory services to the rural community.

- The Drought Relief Assessment Project employed 52 people throughout the State for 26 weeks processing drought relief claim forms.

The National Employment Strategy for Aboriginals Scheme provided opportunities in the public sector for aboriginals to develop worthwhile skills to gain better jobs.

The Federal Government funded the scheme and its Aboriginal Employment and Training Branch administered it in cooperation with the Commonwealth Employment Service. The Department had 23 aborigines employed under the Scheme at year's end.

The Special Youth Employment Training Programme was designed to provide trainees with administrative and office skills for future employment. Training was for a period of 17 weeks, with the possibility of permanent employment at the end of this period. The Department had 25 trainees employed at the end of the period.

The State Youth Corps provided valuable work experience and training to unemployed young people. The Department employed 100 people under the scheme.

Special Employment Programmes

The Department was actively involved in initiating and implementing Community Employment Programme projects throughout the State. The programme funded employment projects which are of demonstrable benefit to the community, which are located in areas of high unemployment, and which are aimed at employing disadvantaged groups.

Between December 1983 and June 1984, the Department had 75 CEP Projects approved, employing 371 people for periods ranging from 3 to 12 months. Of this number, 218 were males, 153 were females, and 240 of the 371 were employed under the CEP Youth Initiative.

Funding for CEP Projects came from the Federal Government (70 per cent) and the State Government (30 per cent).

The Youth Employment Scheme was State Government funded and provided 17 weeks employment for school leavers and other unemployed young people. The Department employed 183 (97 males and 86 females) on this scheme.

Training

The training section substantially increased the number and variety of courses offered to staff to both improve efficiency and enhance personal development. Kits and procedure manuals were developed on:

- Selection techniques for committee members
- Ministerial letter writing
- Induction and leave conditions
- Job seeking skills
- Computer familiarisation
- Skills for new typists
- Leave procedures
- Performance appraisal and development

Safety

There was a significant decrease in the accident rate with 27 fewer accidents reported, and thus 675 fewer lost days. This decrease in lost time reduced the Department's workers' compensation premium by 0.11 per cent — despite an increase of 30 per cent in the insurer's premium rate.

The Safety Officer visited 107 units to discuss safety issues and advise on safe and proper working procedures and equipment.

Management Audit and Analysis Branch

The Branch completed 24 financial and administrative audits during the 1983-84 financial year, and conducted six comprehensive reviews to evaluate procedures, investigate issues, and make recommendations in the:

- Administrative procedures of the fisheries licensing branch
- Commonwealth Fodder Subsidy Scheme
- Prices section — Division of Marketing and Economic Services
- Departmental cottages
- Motor vehicle use within Head Office
- 1983 stocktake result

Specific financial evaluations were carried out for the:

- Agricultural Bureau of NSW
- Rural Youth Organisation
- Noxious Insects Destruction Account
- Potato Growers' Association
- Numeralla Investment — C.B. Alexander Fund

Eight workshops/seminars were conducted at Head Office and in the regions for 172 staff on the new Public Finance and Audit Act.

Industrial Section

The Industrial Commission of NSW varied the awards to a 38 hour working week with a rostered day off in each 20 day working cycle in the following classifications:

- Operators and supervisors, Prickly Pear Destruction Commission
- Farm assistants
- Crown employees (watchmen, caretakers, cleaners and lift attendants)
- Gardening, parks and horticultural and landscape staff

Following the amalgamation of the classifications of Port Inspectors and Inspector (Plant Diseases Act), 17 hearings were held for a new award for about 160 Agricultural Inspectors.

More than 900 people were employed by the Department during the year on special employment scheme projects.



Accommodation Section, Management Services Branch

The section completed 28 accommodation projects and started 15 others. One major project was the construction of the Head Office computer facility. Assistance was provided for constructing computer sites at Yanco Agricultural Institute and Trangie Agricultural Research Centre and planning began on similar sites to be completed at Tamworth, Orange and Wollongbar next financial year. As part of the Head Office computer facilities, specifications were written and tenders called for 28 ergonomically designed workstations for systems analysts, technical support, word processing and data entry staff, computer operators and accommodation officers.

Accommodation officers were involved in arranging new offices opened at Lockhart, Walgett and Wellington, and in major office reorganisations completed at 14 regional locations.

Executive Secretariat

The Branch helped organise the Department's hosting of the 20th meeting of the Standing Committee on Fisheries and the Australian Fisheries Council, plus the Farrer Memorial Oration at the Queensland Agricultural College, Gatton.

STAFF AT

30th JUNE 1984

Minister for Agriculture and Fisheries
Hon J.R. Hallam, M.L.C.

Director-General

G.H. Knowles

Deputy Director-General

Dr K.P. Sheridan

Executive Director (Administration)

S.J. Day

Executive Director (Fisheries)

Dr D.D. Francois

Executive Director (Policy & Services)

J.E. Jessup

Executive Director (Regulatory Services)

G.R. Gregory

Executive Director (Research & Advisory Services)

Dr S.G. Grimmett

Executive Assistant to Director-General

R.J. Jessup

Executive Assistant to Deputy Director-General

F.S. Benecke

Chief, Division of Agricultural Services

P.A. Witschi

Chief, Division of Animal Health

D.A. Dickenson

Chief, Division of Animal Production

P.T. Gilchrist

Chief, Division of Fisheries

Dr P.A. Ayres

Chief, Division of Marketing & Economics

Dr C. Gellatly

Chief, Division of Plant Industries

R.A. Claxton

Chief Administrative Officer

R.T. Swan

Director, Biological & Chemical Research Institute

Dr A.M. Smith

Regional Director of Agriculture, Region 1†

B.D. Scarsbrick

Regional Director of Agriculture, Region 2

Dr A.N. Smith

Regional Director of Agriculture, Region 3

O.R. Southwood

Regional Director of Agriculture, Region 4

Dr D.G. McDonald

Regional Director of Agriculture, Region 5

D.E. Toohey

†Region 1: North Coast. Region 2: New England, Hunter & Metropolitan. Region 3: Orana & Far Western. Region 4: Central Western, South Eastern & Illawarra. Region 5: Murray & Riverina.

Staff Statistics as at 30th June 1984*

	1	2	3	4	5	Metro- politan	Other	Total
Administration	7	11	8	9	11	154		200
Marketing & Economics	4	6	3	6	7	44		70
Animal Health	67	122	45	108	68	159		569
Animal Production	35	50	27	47	26	54		239
Plant Industries	40	93	26	48	85	180		472
B. & C.R.I.	6	25	3	5	14	158		211
Agricultural Services	140	302	81	159	280	119		1081
Division of Fisheries	14	51	5	24	26	49	14	183
Cattle Tick	98							98
Sub Total	411	660	198	406	517	917	14	3123
NESA	—	4	2	5	5	2		18
SYETP	4					2		6
CEP	45	74	16	24	42	90		291
YES	16	17	9	32	16	25		115
YIP	6	22	—	11	26	16		81
WP	15	5	4	6		7		37
SYC	48	41	5	11	43	21	169	
NESA Apprentices	1				2			3
Displaced Apprentices	1				3	1		5
Sub Total	136	163	36	89	137	164		725
Ministerials — BTC							241	241
PPDC							38	38
Sub Total							279	279
Total	547	823	234	495	654	1081	293	4127

*Actual staff members employed at 30th June; there were also 266 vacant positions and 109 positions filled by casuals.

Regional Reports



REGION 1 North Coast

Rural Resource Management

Increasing pressures were being brought to bear on the region's rural resources and the rural community. These pressures stemmed from:

- an increasing population (and a consequent increase in competition for land and water resources);
- subdivision and alienation of good agricultural land (and resultant rural/urban conflicts);
- the development of more intensive cropping enterprises on traditional coastal hillside grazing lands; and,
- a growing environmental consciousness within the community and subsequent increasing concern about pesticides, soil erosion, declining tree cover and noxious weeds.

Several significant rural resource management initiatives were implemented to help meet these pressures.

- The region initiated a rural resource committee which brought together nine State Government authorities and interested groups, all with interests or responsibilities in rural resource management. It aims to facilitate better management of regional rural resources, particularly land resources, by providing coordinated advice and assistance to local and State government authorities and the public.
- As a result of close regional cooperation between the Department and the Soil Conservation Service, a two-day workshop was conducted on soil conservation needs and cultural practices for coastal soybean

production. Over 30 professional officers from both organisations participated. A direct drill project team was subsequently formed to encourage and help research into the effects of tillage on coastal soybean soils, and to promote conservation practices.

- As part of the region's continuing programmes to reduce pesticide residue contamination problems and to improve pesticide use practices, staff were developing strategies to reduce organo-chlorine use and subsequent contamination problems which emerged in the dairy, beef, pig and horticultural industries.
- A spray application technology working party was formed to improve the region's provision of up-to-date information about the relative effectiveness of modern spray machinery in coastal horticulture and cropping industries. Its first task was to develop an information bank on effective spray application techniques for coastal orchards and plantations.
- A regional noxious plants advisory officer was appointed and started cooperating with local councils, the special weeds agronomist, and the Queensland Department of Primary Industries in trials to develop integrated controls for salvinia, groundsel bush and ragweed using biological and chemical means.

- Progress was made in developing regional agricultural land use strategies with the Department of Environment and Planning, Soil Conservation Service and local government planners.

Cattle Tick Control

On 1st July 1983 a new cattle tick control policy announced by the Minister in January 1983 came into operation.

The most significant changes incorporated in the new policy were the elimination of the compulsory dipping programme and the orderly transfer of dip operation and maintenance responsibilities to stockowners. A major regional advisory programme to implement the new policy was developed and was initially aimed at ensuring that as many stockowners as possible within the Tick Quarantine Area adopted the strategic dipping programme as recommended by the Board of Tick Control. Stockowner response to the recommended programme exceeded all expectations with 85 per cent of stockowners in the old compulsory dipping area participating.

Equally significant was the fact that 41 per cent of stockowners in the old northern examination area also participated. These stockowners had not been compelled to dip for many years.

The next phase of the programme aims at ensuring the orderly hand over of cattle dips to stockowners.

A threatening oversupply of bananas and avocados could lead to considerable plantings of other fruit crops and tea, shown here, on the North Coast.



This will be one of the most significant regional advisory campaigns ever undertaken by the Department especially considering that there are over 1100 operational dips and 7500 stockowners within the Tick Quarantine Area.

Diversifying the Production Base of North Coast Agriculture

Interest in the production of tropical fruits, tea and soybeans increased amongst new and existing producers. These and other crops will help diversify the region's agricultural base and improve its future stability.

Increased plantings of macadamias, avocados, lychees, custard apples, kiwifruit and low chill stonefruit occurred throughout the region, particularly on the far north coast. There was also significant interest in new fruit crops including blueberries, carambolas, casimiroas, mangoes, longans, feijoas, tangellos, loquats, Asian pears, early maturing grapes and babacos. A threatening over supply of avocados and bananas could lead to considerable diversification into some of the new fruit crops during 1984-85.

Tea production attracted much interest, and almost 200 local and interstate participants attended a tea seminar at Wollongbar Agricultural Research Centre.

Management problems associated with high rainfall area cropping emerged within the coastal soybean industry. Of particular concern were black leaf blight and the increasing incidence of soil erosion.

Disease Control in Livestock

Studies started in the diagnosis and control of stomach fluke and of disease due to internal parasites in goats. Many internal parasites are recognised as serious causes of loss in coastal goat herds.

About half the cattle herds scheduled for brucellosis testing in round three were tested. It was estimated that testing will be completed by mid 1986. One third of the dairy herds in the Grafton area were tested by the end of May. Tuberculosis was not confirmed in any of the 40 556 dairy cattle tested, but one case of tuberculosis was detected in the 6220 beef cattle tested.



Fisheries

Preliminary studies on red spot disease and pesticides in fish in the Clarence River were completed. More detailed studies on red spot in affected sea mullet from the Richmond River and on captive fish was to be undertaken at the Regional Veterinary Laboratory.

Plant Research

A new maize hybrid, GH5010, bred at Grafton Agricultural Research and Advisory Station was released for commercial production. It is a midseason single cross hybrid with outstanding yielding ability, suited to both coastal districts and irrigated areas of the slopes and Riverina.

Tomato nutritional studies at the Tropical Fruit Research Station, Alstonville, showed that yield increases of more than 100 per cent and higher fruit quality can be achieved through continuous nutrient application through trickle irrigation. A seven year trial studying the irrigation of macadamias showed that yields can be increased by up to 50 per cent.

Following earlier studies at Wollongbar Agricultural Research Centre of the epidemiology of the banana virus disease, bunchy top, and subsequent development of models for describing the spread of the disease in time and space, a computer program was developed that helps simulate the disease spreading. The program displays an "epidemic" on a video screen and allows the operator to simulate disease control options such as destroying diseased and surrounding apparently healthy plants and controlling the aphid vector.

REGION 2

New England, Hunter & Metropolitan

Seasonal conditions throughout the year were excellent with above average rainfall in most parts of the region. Heavy rain during February resulted in major flooding in the Namoi River system with some losses of cotton and other summer crops. Pastoral conditions were excellent throughout the year with good carryover feed going into autumn. However, cattle losses from bloat were very high, particularly in the Hunter Valley, and were greater than those from the previous drought. The season also induced a major problem of three-day sickness in dairy cattle.

Wheat

A record area of wheat was sown, and despite problems with waterlogging, spray drift and stripe rust, 2 600 000 tonnes from the 1983-84 harvest were delivered to the Grain Handling Authority from the northern wheat belt. Sowing of the 1984-85 crop was generally late as a result of inadequate autumn rains.

The very wet conditions made stripe rust a major problem in the region for the first time. Departmental recommendations for spraying stripe rust affected wheat in southern New South Wales were ineffective under northern conditions. However, as a result of a coordinated research and advisory programme, guidelines for treating stripe rust in northern New South Wales were developed.

Mouse Plague

Mice were a major problem of summer crops in the Gunnedah, Narrabri and Moree districts. Reports of mouse damage varied from negligible to 100 per cent loss of crops, and damage was estimated at \$2,000,000.

Tocal Small Farms Field Days

The inaugural field days for operators of small farms was held at C.B. Alexander Agricultural College in May 1984. Organised as a cooperative effort between advisory and College staff, educational activities included lectures, practical demonstrations and displays on nearly all aspects of small farm management. Public response exceeded expectations with about 7000 people attending over the two days.

Continuing Education

Short courses on a range of subjects were conducted throughout the region for producers. Courses included: pesticides in the mushroom industry; poultry health; soils; livestock appraisal; computers; apiculture; dairy nutrition; and the house cow. The region also had 48 per cent of the total State enrolment in the Farm Management and Farm Office Management home study courses, and monthly tutorials were conducted for participants throughout the region. About 500 students attended residential schools conducted at Armidale, Camden and Tocal.

Cooperative Animal Health Programmes

Major animal health advisory programmes were jointly implemented by livestock officers and veterinary officers. In particular, clostridial disease prevention by vaccination was promoted for sheep and beef cattle. A major media and promotion campaign was supported by farmer field days and meetings of resellers. The programme was financially supported by all vaccine manufacturers, and monitoring of vaccine sales was used to evaluate the results. Sales of the recommended vaccines increased by between 20 and 300 per cent at various outlets as a result of the programme. Other cooperative programmes included: mastitis control in dairy cattle; poultry respiratory diseases; ovine brucellosis; and internal parasite control in sheep on the tablelands.

Fisheries

The L.P. Dutton Trout Hatchery reopened as a tourist attraction on Boxing Day after an upgrading of the visitors centre with aquarium displays of inland fish and informative poster material. Over 5000 visitors had inspected the Hatchery since the reopening.

Land Use Planning

The Department's role in rural land use planning gained momentum in the region with the staging of four very successful discussion days with local government representatives. They were held at Armidale, Gunnedah, Maitland and Muswellbrook, and attracted 180 representatives from Councils and other Government departments in the Region. The Minister for Agriculture and Fisheries, the Hon. J.R. Hallam, attended the Armidale and Maitland days, and Mr G.H. Knowles, Director-General of the New South Wales Department of Agriculture, attended all four days.

Trees on Farms

Research and advisory officers at the Agricultural Research and Advisory Station, Glen Innes, were redeveloping tree cover on the Shannon Vale Sub Station. The programme included testing native and exotic tree species for their suitability to the region; finding methods for establishing tree cover on farms; and calculating the environmental and production benefits likely from increased tree

cover on tablelands properties. The project was helped by a grant from the Commonwealth Employment Programme for a technical officer and support staff to study and implement tree planting on Shannon Vale. While the Department was main sponsor, representatives from the National Parks and Wildlife Service, the Soil Conservation Service of NSW, and the Forestry Commission will be involved at all stages of planning and execution.

Soil Fertility

Major changes to cropping systems are required to ensure that the long term fertility of wheat belt soils is maintained and restored. Plans were underway to monitor the current nutrient status of local cropping soils; to investigate the reasons for the wheat yellowing seen in northern New South Wales in 1983 and 1984; to improve soil testing procedures to more accurately predict crop fertilizer requirements; and to assess the impact of no-tillage techniques and grain legumes on cropping soil fertility. The exercise involved scientists at the Agricultural Research Centre, Tamworth, advisory officers, and the Soil Conservation Service.

The Department had an increasingly important role in land use planning.



REGION 3

Orana & Far West Region

Semi-Arid Rangelands

A rangeland management and advisory unit was established at Cobar with two research agronomists, a veterinary officer, several technical support field officers, and administrative staff. The unit will develop strategies for land management aimed at stabilising the ecosystem and maximising economic returns.

Prescribed Burning for Shrub Control

Encroachment of inedible woody shrubs has reduced stock carrying capacity and inhibited stock management and surveillance in the semi-arid woodlands of north western New South Wales.

Research showed controlled burning to be an effective way of reducing inedible shrubs and improving useful perennial grass and herb production. Information on using fire as a management tool was presented by departmental advisory officers at a major seminar in Bourke in July 1983 which attracted over 100 graziers. As a result of the seminar and subsequent field day demonstrations, 30 graziers intended to undertake scrub burns on their properties. Departmental officers at Bourke provided guidance and advice to landholders on safe and effective burning techniques and were developing a computerised cost benefit analysis of the operation.

Plant Species for Semi-arid Rangelands

Productivity of semi-arid rangelands depends largely on the presence of an abundant cover of perennial pasture species. Heavy grazing pressures in past years resulted in the disappearance of some productive

and palatable perennials and their replacement with less productive short-lived annuals and inedible woody shrubs.

Introducing forage plants from other parts of Australia and overseas may improve range condition and productivity in areas requiring reclamation after shrub invasion or cropping. The Department, CSIRO and the Soil Conservation Service were working together on three major programmes to identify pasture species for this environment.

Collected grasses, legumes and fodder shrubs from similar overseas climatic regions were being screened for more widespread testing in trials at Cobar, Bourke and Yantabulla.

The African lovegrass variety Consol, selected by the New South Wales Soil Conservation Service, was being evaluated for its palatability and persistence at a number of trial sites throughout the marginal wheat zone and semi-arid north west plains.

Buffel and birdwood grasses from overseas and Western Australia were being assessed with several local ecotypes for persistence, growth habit, frost tolerance and seed production in the Bourke district.

REGION 4

Central West, South East & Illawarra

The record cereal crop greatly helped farmers to recover financially after the drought. However, rain caused significant grain damage and delays to harvest.

The 1984 sowing period was marked by dry conditions and major problems from the mouse plague which destroyed many early cereal sowings in the central west. Mice also destroyed large quantities of cereal hay produced during 1983.

Pastures responded to the improved rainfall and provided excellent feed supplies throughout the year. Weeds, particularly Paterson's curse and thistles, dominated many areas, but many improved pasture species regenerated and provided competition to weeds.

Particular efforts were directed towards controlling serrated tussock using special employment programmes and with the cooperation of local government.

Rural Land Use Planning

The significant activities in this area continued, and assessments were made of Cowra, Cabonne, Bathurst City, Eurobodalla and Bega Valley Shires.

The central west part of the region was being mapped and its agricultural capability assessed. Surveys of the coastal strip from Wollongong south to the State border were completed. Techniques were developed for using Landsat data with ground surveys.

Advisory Services

Coordinated activities included producer involvement in planning meetings which identified the broad areas of finance, spray technology and pasture protection for advisory activity.

A field day was jointly held with the Livestock & Grain Producers' Association to demonstrate farm practices to the New South Wales Animal Welfare Committee.

Advisory officers provided information to prime lamb producers to help them overcome declining market demand and prices.

Video equipment was purchased to enable a video library of advisory programmes to be developed.

Research

Changed seasonal conditions enabled the conduct of a large programme of agronomy research, including variety evaluation, tillage technique studies and weed control.

A significant programme to develop plant-attacking fungi (mycoherbicides) for controlling specific weeds started, supported by a visit to Orange by US expert, Prof. G. Weidemann, from the University of Arkansas.

The guayule rubber project at Condobolin progressed further as a result of the 12 months visit by Prof.

W. Whitworth of the University of New Mexico, and chemical weed control techniques were developed for Australian conditions.

Continuing animal projects emphasised factors limiting wool production; development of a self replacing prime lamb breed; improvement of reproductive efficiency in sheep; the genetics and management of goats for fibre, meat and skin production; and weed control.

Considerable effort was given to monitoring mouse populations and to testing control methods.

Veterinary Services

As a result of the foot and mouth disease extortion threat in January, top priority was given to training animal health, advisory, and fisheries staff, and to liaison with key members of cooperating departments and other bodies. A computerised system of feral animal monitoring, FERALFIND, was established across the region, and stores of emergency disease outbreak equipment set up.

The harmful effects caused to sheep eating Paterson's curse were investigated, and the epidemiology and laboratory diagnosis of Johne's disease in sheep were studied.

Computer-derived and other electronic devices are becoming almost commonplace in agriculture. The US-built Apple Scab Predictor was evaluated by the Department for its usefulness under New South Wales conditions.



REGION 5

Murray & Riverina Region

Trees on Farms

The Murray & Riverina Region convened a Trees on the Farm project involving the Forestry Commission of New South Wales, Soil Conservation Service, local community groups and farmer cooperators. Ten demonstration farm plantings between the highlands and the western wheatbelt/mid-Murray irrigation areas were being established, as were an arboretum at Finley and a tree research site on Wagga Agricultural Research Institute.

The project will alert the farming and general communities of the desirable economic, environmental and aesthetic features of trees on the farm. All regional staff were involved, with the emphasis on advisory activities, residential short courses at Murrumbidgee College of Agriculture, and on home study courses.

Irrigated Land Management

The Murray & Riverina Region has two-thirds of the State's irrigated land. Advisory, educational and research irrigation projects worked together towards efficient sustainable irrigated land management. Programmes included salinity, irrigation scheduling, irrigation layout and systems, soil management, irrigation productivity, and farm management.

Research and advisory activities in the mid-Murray were increased, a special agronomist (salinity) appointed, and better dairy pasture species and water management strategies developed.

Research included reduced water use, greater irrigation efficiency in wheat, and effects of low quality water on lower-Murray horticulture.

A water watch advisory service helped growers integrate weather effects with crop irrigation requirements.

An irrigation demonstration block at Murrumbidgee College of Agriculture enabled farmers and students to assess many commercially available citrus irrigation systems.

Western Division

A veterinary officer with dual animal health/animal production advisory responsibilities was appointed at Dareton.

A project team searching for suitable cropping techniques for southern New South Wales areas with less than 375 mm average annual rainfall developed suitably modified sowing and harvesting equipment.

Horticulture

The Murray & Riverina Region is the State's major horticultural region. Many horticultural industries suffered marketing problems in recent years and problems arose because of the long delay inherent in changing the direction of perennial horticulture.

Uncertainty in the Murrumbidgee Irrigation Area canning fruit industry was largely overcome by the appointment of a new board of directors to the Leeton 'Letona' cannery. Emphasis must now be on maintaining adequate cannery output, and a planting advisory committee from the Department, the cannery and growers will guide new plantings.

Exports of dried vine fruits have declined and will not support the present 750 Sunraysia dried vine fruits growers. Advisory programmes assisted growers to find alternative enterprises or outlets for dried fruit grape varieties. Some Sultanas were being used by wineries, which influenced the extent of crushing of wine grapes.

The wet spring and summer encouraged intense mosquito plagues throughout the region, especially in the irrigated sections. As well as causing severe irritation and consequent productivity loss to man and beast, mosquitoes acted as disease vectors for Ross River fever in humans, swine pox in pigs and heartworm in dogs.

The Region worked with community groups, local government and the Health Department to manage the immediate problem and to develop strategies for future plagues. Arrangements were made to assist in monitoring the over-wintering ability of Ross River virus in a range of livestock species.

The use of maldison to control mosquitoes in urban areas was proposed, but caused public controversy, and was a potential danger to the parasitic control of citrus red scale (the adult predatory wasps are highly maldison-susceptible). Instead, Abate® was applied into irrigation water to control mosquito larvae. Trials were started at Yanco Agricultural Institute to look at longer term maldison effects.



Insect Control in Peach Orchards

A breakthrough in alternative insect control took place in Murrumbidgee Irrigation Area peach orchards. Yanco Agricultural Institute and CSIRO entomologists used sex pheromones (chemical sex attractants) to disrupt mating of oriental fruit moth. Pheromones released from simple plastic vials in each tree confused the male moths, thus preventing them from finding their mates and breeding offspring that damage peach fruit. A dispenser for commercial use, produced in Japan for an Australian company, proved to be satisfactory in Leeton peach orchards.

Appendixes

APPENDIX I

Diagnostic and Testing Services

Animal Health Diagnostic Services

Number of serum samples received for tests under the bovine brucellosis eradication programme

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Eradication Testing	2 732 790	3 622 750	3 442 590	2 593 827	2 112 285	1 325 490	1 459 630
Abattoir Monitoring	535 480	560 160	547 430	597 220	429 390	550 330	327 560
TOTALS	3 268 270	4 270 820	3 990 020	3 191 047	2 607 675	1 875 820	1 787 190

Origin and source of specimen consignments other than those directly concerned with the brucellosis eradication campaign, 1983-84

Origin

Cattle	11 245	(44%)
Sheep	5 309	(21%)
Pigs	1 410	(6%)
Poultry	1 602	(6%)
Goats	1 723	(7%)
Horses	1 701	(7%)
Other species	2 104	(8%)
Other specimens	256	(1%)
TOTALS	25 350	(100%)

Source

Private Practitioners	56%
Veterinary Inspectors	23%
Departmental Officers	19%
Others	2%
TOTALS	100%

Plant Health Diagnostic Services

A total 3442 plant specimens were handled for disease identification, and 545 for parasitic nematodes. Over 70 plant diseases were recorded for the first time in New South Wales, and 1819 specimens were added to the Biology Branch Herbarium (Herb. DAR). Outside organisations were supplied with 94 living cultures from the culture collection and 54 specimens were loaned from Herb. DAR to other institutions.

Australian Inoculants Research and Control Service

A total of 426 cultures were tested during production, an increase of 79 per cent over 1982-83, and, of these 288 were passed (68 per cent). Of the 204 packeted inoculants tested from retail outlets, 174 (85 per cent) reached the necessary standard.

Of the 53 broth cultures tested, 51 proved satisfactory.

Argentine Ant Eradication Campaign

Infestations

New and reinfestations	3
Area sprayed (hectares)	12.7
Surveys (hectares)	45 514
Surveying (number of local government areas)	5

Re-surveys

Number of local government areas	28
Area (hectares)	3 582.7

Inquiries

Telephone and personal	4 136
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B. & C.R.I. Chemistry Branch Analytical tests conducted

Type of Analysis	Number of Samples	Number of Analyses
Soil, chemical analysis	13 814	88 501
Soil, physical analysis	1 772	7 785
Plant tissue	6 452	67 376
Mushroom compost	153	612
Fertiliser	242	968
Water	1 414	18 045
Pesticide	433	1 357
Stock food	279	607
Stock medicine	60	71
Total	24 619	185 322

Advisory assessments

Type of Assessment	Number of Reports
Soil, chemical fertility	3 393
Soil, physical fertility	270
Plant nutrition	1 386
Mushroom compost	153
Fertiliser quality	104
Water quality	1 414
Pesticide formulations and residues	77
Stock food composition	170
Stock medicine composition	60
Total	7 027

Seed Production in NSW

Certified pasture seed in tonnes

	1973-74	1978-79	1981-82	1982-83	1983-84
Sub clover	1 066	1 191	303	34	609
Annual medics	41	23	—	—	—
Lucerne	275	63	192	139	64
Other clovers	1	56	66	104	99
Temperate grasses	187	442	5	57	335
Tropical grasses	—	—	3	1	13
TOTAL	1 570	1 775	569	335	1 120

Registered cereal seed in tonnes

	1980-81	1981-82	1982-83
Wheat	5 517	5 222	4 748
Oats	976	804	760
Barley	811	1 200	748
Cereal rye	—	1	—
Triticale	—	167	85

Certified seed production of grain legume, oilseed and hybrid maize crops in tonnes

	1980-81	1981-82	1982-83	1983-84 (1.10.83 to 30.6.84)
Lupins	144	123	21	219
Adzuki beans	2	5	—	—
Chickpeas	18	40	—	*
Mungbeans	17	—	12	*
Soybeans	15	8	31	*
Oilseed rape	—	44	31	11
GH Maize	15	90	162	60

*Quantities of seed of each of these types produced, but due to the late season certification was incomplete by 30th June 1984.

Seed samples tested in the seeds laboratory

	1980-81	1981-82	1982-83	1983-84
Quarantine and regulatory	880	581	2 246	985
Certified and registered	1 585	1 261	550	1 420
Commercial seed	1 148	1 463	1 234	1 763
Seed Industry Association Scheme*	—	—	—	54
Departmental samples	585	585	493	575
Other Departments	77	84	119	133
Seeds for identification	122	161	104	85

*Implemented 1983-84

APPENDIX II

Summary of Department's Regulatory Activities Under Various State and Commonwealth Acts

A. STATE ACTS

Farm Produce Act, 1983

Licences issued to 30th June 1984	21
Complaints	45
Packages castaway at market	3 416

Agricultural Holdings Act, 1941

Disputes referred to Minister for Agriculture & Fisheries	1
Arbitrations by Agricultural Committees	2

Plant Diseases Act, 1924

Notices issued for pest & disease control	446
Inspections Orchards, plantations, vineyards	25
For advice/regulatory action	10 611
For planting statistics only	908
Fruit shops and stalls	5 318
Grain storages and processing premises	754
Nurseries	3 281
Resellers	3 096
Home gardens	28 758
Detections of bunchy top in banana plantations	1 808

Packages detained at Sydney & Newcastle markets for non-compliance with regulations

	Packages	Bulk bins
Apples	45 010	14
Pears	25 722	43
Citrus	12 878	2
Grapes	9 677	
Rockmelons	4 236	
Tomatoes	13 712	
Potatoes	81 324	
Bananas	2 800	
Mangoes	659	
Avocados	1 463	
Lettuces	1 446	
Carrots	1 836	
Pumpkins	892	10
Onions	6 984	
Total	208 639	69

Potato Growers Licensing Act, 1940

Growers licensed	347
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Pesticides Act, 1978

The Pesticide Registration Section considered 628 applications for registration of new products under the Act; 587 applications for registration of additional labels for registered products; and 154 applications for approval of additional containers.

In addition, 310 applications for issue of permits under the Act were considered.

Registration assessments	17
Samples analysed	30

Cattle Compensation Act, 1951

Compensation was paid for 2571 cattle ordered to be destroyed because of suspected disease and for three carcasses condemned during meat inspection.

Diseases on which claims were paid

Diseases	Claims	Cattle & Carcasses
Brucellosis	444	1 286
Tuberculosis	133	1 212
Johne's disease	7	13
Other	30	60

Poultry Processing Act, 1979

Poultry plants registered	110
Water retention tests carried out	359
Inspection visits	1 995
Prosecutions:	
Excessive water retention in carcasses	13
Use of unlicensed premises	1

Stock (Artificial Insemination) Act, 1948

	Cattle	Sheep
Premises licensed as at 30th June		
Centres	3	5
Sub-centres	5	1
Certificates of Competancy issued to 30th June	101	3

Stock (Chemical Residues) Act, 1975

Samples of fat collected from cattle slaughtered at abattoirs were analysed for the presence of chemical residues. In all 8537 samples were taken, 8021 of these were analysed and 6727 (84 per cent) of all samples were free of residues.

Stock Diseases Act, 1923

Quarantine was applied for the following diseases:

Disease	Number of Quarantines	
	Properties	Stock
Anthrax	3	2 996
Brucellosis in cattle	186	
Lice in sheep	744	840 591
Ked in sheep	2	4 000
Lice and ked in sheep	0	
Tuberculosis in cattle	52	
Tuberculosis in pigs	0	0
Tuberculosis in poultry	5	
Tick fever in cattle	0	0

Prosecutions

A total of 25 persons, involving 36 charges, were prosecuted resulting in fines totalling some \$11,700. Offences involved in these prosecutions included:

Lice in sheep	11
Footrot in sheep	2
Brucellosis in cattle	1
Swill feeding of pigs	3
Tail tagging of cattle	8
Queensland border crossings	7
Tick Quarantine Area	3
Threatening of an Inspector	1

Bovine brucellosis for New South Wales: 1983-84

Total herds	55 303
Dairy herds	2 881

Monitoring:

Abattoirs	
Blood samples	335 188
Positive bloods	93
Confirmed reactors (per cent)	0.03
Herds in which positives were found	81
Milk Ring Testing	
Herds checked	2 881
Positive MRT herd tests	80
MRT positives in previously negative herds	38
Miscellaneous Field Testing	
Herds tested	1 793
Cattle tested	50 985
Reactors	394

Total Monitoring:

Herds tested	33 310
Herds positive	232
Cattle tested	386 173
Reactors	443

Eradication:

Herds tested during year	18 957
Blood samples tested	1 406 170
Reactors	833

Disposal of Reactors:

Reactors for which compensation paid	1 286
Net compensation paid	286 753.01

Vaccination:

Cattle vaccinated with Strain 19	113
Doses of Strain 45/20 used	0

Infection data: progress to 30th June 1984

Herd status	No.	per cent
Not assessed	643	1.20
Suspect	20	0.00
Infected	98	0.20
Restricted	70	0.10
Provisionally clear	229	0.40
Tested negative	1 647	3.00
Monitored negative	71	0.10
Confirmed free*	52 449	94.80
Accredited free	32	0.10
Prevalence (per cent)		
Herd		0.18
Individual		0.01

* Confirmed Free herds can move anywhere in Australia. They only need a Form 3 and the approval of an Inspector.

Bovine tuberculosis in New South Wales 1983-84

Basic statistics

No. of cattle herds	62 194
No. of cattle	5 556 375

Monitoring

No. of cattle slaughtered with TB lesions (presumed plus confirmed)	18
No. successful tracebacks to herd of origin	17
Percentage of successful tracebacks	94.4

Testing

No. cattle tested	155 959
No. reactors	527
Total no. herds tested	1 010
No. herds confirmed infected	7
No. herds tested from traceback	12

Eradication

No. infected herds (at beginning of year, plus those detected during the year)	29
No. herds tested	30
No. cattle in infected herds	8 094
No. individual cattle tests	12 293
No. reactors	194

Disposal of Reactors

No. reactors detected	721
No. reactors slaughtered	678
No. reactors autopsied (meatworks and field)	678
No. reactors with lesions	238
No. reactors for which compensation paid	676
No. casual cases for which compensation paid	2
Net compensation paid	\$351 940.27

Laboratory

No. bacteriological accessions	47
No. with confirmed tuberculosis	18

Infected Herds

No. infected herds at beginning of year	16
No. cattle in infected herds at beginning of year	4 019
No. infected herds at end of year	13
No. cattle in infected herds at end of year	5 747
No. reactors with lesions at most recent herd test in all known infected herds	37

Prevalance (per cent)

Herd	0.02100
Individual	0.00067

The Board of Tick Control Laboratory examined 27 637 samples

Dip analysis

Chemical analyses	13 419
pH determinations	2 236

Pesticide residue survey

Animal fat samples	10 426
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Residue development

Samples	1 556
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Queensland Border Control

Inspectors on the border outside the Tick Quarantine Area supervised the entry into New South Wales of 268 319 cattle, 1 344 378 sheep, 34 660 pigs, 37 172 horses, 6275 goats and 215 other animals.

Swine Brands Registration (30.6.84) 6 880

Board of Tick Control major activities within the Tick Quarantine Area:

Activity	Cattle	Horses	Sheep & Goats	Carcases
Examinations	1 691 801	32 742	269	291 75
Dippings (including voluntary dipping)	2 509 372	867	61	
Spraying	6 962	28 409	248	
Policy examinations	445 273			
Movement control	790 672	27 836		

Stock Foods and Medicine Act, 1940**Stock foods**

Foods analysed	363
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Stock medicines

Products analysed	60
Products sampled	358
Registrations	580
Re-registrations	1 612
New preparations	185
Outstanding	119
Refused	1
Prosecutions	Nil

Chicken Meat Industry Act, 1978

Agreements registered	450
Disputes	6

Registration of Stock Brands Act, 1921

Applications	
New South Wales	1 008
Victoria/Australian Capital Territory	52
Transfers	219
Re-gazetted	92

Swine Compensation Act, 1928

Compensation was paid for four carcasses condemned during meat inspection because of septicaemia, and for one carcase condemned because of tuberculosis.

Fertilisers Act, 1934

Re-registrations	420
New registrations	92
Registrations refused	15
Samples analysed	104

Veterinary Surgeons Act, 1923**Registrations with Veterinary Surgeons**

Board: Total registrations increased by 54 to 1507 as at 30th June 1984. This involved 130 new registrations, 20 restorations, and 96 removals from the register.

Disciplinary matters: The Veterinary Surgeons Investigating Committee investigated 21 complaints for professional misconduct. Fifteen of these complaints were dismissed, two veterinarians were reprimanded and four complaints were referred to the Veterinary Surgeons Disciplinary Tribunal. The Tribunal found three veterinary surgeons guilty of professional misconduct. One veterinary surgeon was suspended for nine months; one veterinary surgeon reprimanded and the other veterinary surgeon cautioned.

Licensing of veterinary hospitals: The number of premises licensed increased to 420. Over half of these have now been inspected with nearly all premises being satisfactory or requiring only minor deficiencies to be rectified. Of the licensed premises, 210 are within the area of the Regional Veterinary Officer, Seven Hills. Licences issued involve 106 Class A, 226 Class B and 88 Class C.

Prosecutions:

Advertising	2
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Apiaries Act, 1916

Apiaries registered (31.3.84)	4 308
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B. COMMONWEALTH ACTS**Export Control Act 1982****Grain exported**

	Tonnes	
	Inspected	Rejected
Ships surveyed for grain export	96	41
Wheat	2 331 339	19 824
Rice	256 600	—
Barley	159 982	13 401
Malt barley	12 786	—
Sorghum	—	—
Oats	59 946	—

Fresh fruit and vegetables exported

	Tonnes	
	Passed	Rejected
Apples	55 127	3 697
Pears	40 468	4 190
Citrus	77 403	5 029
Stone fruits	129 935	4 728
Grapes	99 365	6 448
Strawberries	8 620	1 280
Pineapples	4 048	168
Mangoes	44 121	1 620
Rockmelons	46 434	821
Tomatoes	46 170	1 318
Kiwifruit	17 590	122
Other fruit	16 914	735
Potatoes	24 434	1 342
Onions	19 086	761
Other vegetables	198 041	1 541

General

	Inspected	
Vegetable seed	6 881	packages
Palm seed	2 368	packages
Plants	3 759	packages
Pasture seed	8 772	packages
Maize seed	3 147	bags
Nuts	5 310	cartons
Tree seed	4 221	packages
Empty containers	3 241	containers

Quarantine Act 1908

Prosecutions: various Acts	328
Quarantine fees collected	\$1,227,787
Passenger clearance	
By sea:	
Vessels met	88
Passenger arrivals	84 072
Quarantine interceptions	879
By air:	
Flights met	7 585
Passenger arrivals	1 265 504
Quarantine interceptions	198 948
Parcels post	
Parcels examined	38 107
Parcels needing quarantine action	6 310
Import permits issued	
General cargo:	
Vessels attended	301
Seed sampled for examination	459
Vehicles steam cleaned	430
Containers:	
Vessels discharged Sydney Port & Botany	890
Containers discharged	192 558
Action on containers:	
FCLs* immediate delivery	96 134
FCLs & LCLs* depot inspection	96 424
FCLs follow up inspections	2 297
Infringements revealed	76
International airport terminal (tonnes)	61 812
Richmond RAAF terminal (tonnes)	559
Timber imports (cubic metres)	483 263
Quarantine treated (cubic metres)	22 871
Approved premises for processing	207

* FCL: full container load; LCL: less than full

Nursery stock

Ornamentals to approved quarantine houses	40 994
Plant Quarantine Station number of lines being:	
Seeds for Department and universities	143
Seeds for private imports	24
Fruit trees for Department	35
Other imports for Department	9
Plants for private importers	6 529
TOTAL Plant Quarantine Station	6 740

Animal imports

Landing permits issued	1 499
Animals landed	
Domestic livestock	2 948
Animal pets	1 211
Aquarium fish	2 535 916
Bees	19
Others	1 622
Animals entering quarantine	
Dogs and cats	433
Horses and donkeys	95
Prohibited materials seized	
Meat and meat products (kg)	3 169
Cheese (kg)	505
Milk products (kg)	934
Eggs	2 184
Egg products (kg)	768
Other materials	232
Rawhide, pieces	1 206
Salmon/trout (kg)	675
Aquarium fish	18 586

Important species amongst the 1103 exotic pests intercepted during quarantine inspections

Woodwasps, Siricidae, <i>Sirex juvencus</i>	1
<i>Urocetus gigas</i>	1
Carpenter ants, <i>Camponotus pennsylvanicus</i>	3
<i>Trogoderma</i> sp. — exotic unknown species	1
Pacific dampwood termite, <i>Zootermopsis angusticollis</i>	6
Mango seed weevil, <i>Cryptorhynchus mangiferae</i>	2
Fruit fly, <i>Tephritidae</i> (larvae)	2
Golden-haired bark beetle, <i>Hylurgus ligniperda</i>	1
Leaf miner, <i>Scaptomyza</i> sp.	1
Drywood termite, <i>Kalotermitidae</i>	3
Katipo or night stinger (Spider), <i>Latrodectus katipo</i>	1
Giant African snail, <i>Achatina fulica</i>	3
Other molluscs, including snails and slugs	10

APPENDIX III

Financial Summary 1983-84

Expenditure during 1983-84 by the Department totalled \$101,836,000 from the Consolidated Fund Recurrent Expenditure Account, while revenue paid into that Consolidated Fund Recurrent Receipts account amounted to \$14,936,000. This expenditure of \$101,836,000 financed:

Advisory Services	\$11,642,000
Agricultural Research	\$14,811,000
Biological and Chemical Research and Analysis	\$5,718,000
Cattle Tick Control	\$9,596,000
Fisheries Operations	\$7,797,000

Advisory Services and Applied Research

Industry bodies, semi-government authorities, private companies and the Commonwealth Special Research Grants provided \$4,440,000 to help fund the Department's many research programmes and some advisory services. Expenditure for the year from these sources of funds was \$3,577,000.

Capital Works Programme

The State Treasury's Consolidated Fund Capital Expenditure Account provided \$800,000 during 1983-84 for capital works.

Drought Relief Payments

Drought relief payments made during 1983-84 from the State Treasury Consolidated Fund Recurrent Expenditure Account amounted to \$13,571,000, and \$8,504,000 from Commonwealth Government Fodder Subsidy Scheme payments.

Accounts for the Financial Year 1983-84

The Department is maintained from the Consolidated Fund Recurrent Expenditure

Account. Capital expenditure on buildings, equipment and permanent improvements to departmental property is a charge against the Consolidated Fund Capital Expenditure Account.

Certain research and development programmes, and, controlling insect pests and animal diseases are funded by industry levies and Commonwealth, semi-government, public and private organisation grants operating through a large number of "Special Deposits" Accounts.

Comparative Statement of Expenditure

Account	1982-83	1983-84	Variation
	\$	\$	\$
Consolidated Fund Recurrent Expenditure	96,005,000	101,836,000	5,831,000 +
Consolidated Fund Capital Expenditure	500,000	800,000	300,000 +
Special Deposits Accounts	80,908,000	50,141,000	30,676,000 -
	\$177,413,000	\$152,777,000	\$24,636,000 -

The major reduction in the Special Deposits Accounts balance is due to the reduction in the Commonwealth Fodder Subsidy Scheme payments from \$46,887,000 in 1982-83 to \$8,504,000 in 1983-84.

Consolidated Fund Recurrent Expenditure 1983-84

Budget Heading	1982-83	1983-84	Variation
	\$	\$	\$
Administration	12,982,000	14,421,000	1,439,000 +
B & CRI	5,198,000	5,718,000	520,000 +
Plant Industries	13,908,000	17,959,000(a)	4,051,000 +
Research Services	13,332,000	14,811,000	1,479,000 +
Advisory Services	9,306,000	11,642,000	2,336,000 +
Animal Health and Production	25,956,000	19,892,000(b)	6,064,000 -
Cattle Tick Control	9,648,000	9,596,000	52,000 -
Fisheries	5,675,000	7,797,000(c)	2,122,000 +
	\$96,005,000	\$101,836,000	\$5,831,000 +

(a) Plant Industries

• Destruction of Noxious Weeds — \$2,500,000. This was a new item for the Department as the responsibility for the destruction of noxious weeds was transferred from the Department of Local Government to Agriculture late in 1982-83.

• *Export Control Act* — Expenses — \$913,000. Inspection services performed under this Act on behalf of the Commonwealth increased by \$193,000 due to the increased grain exports as a result of the breaking of the drought and the resultant bumper grain crops.

(b) Animal Health and Production

• Meat Inspection Service — \$1,678,000. In accordance with the transfer of responsibility of the State Meat Inspection Service to the Commonwealth from 1st July, \$1,673,000 in 1983-84.

(c) Fisheries

Included in the expenditure for Fisheries is the State contribution for the Commercial Fisheries Exploration and Development Fund of \$2,574,000. This amount was transferred to Special Deposits Account 265 and represented an increase of \$1,729,000 on the 1982-83 contribution, as in 1982-83 the Special Deposits Account still had a credit balance of \$1,550,383.

Consolidated Fund Capital Expenditure 1983-84

	\$
Orange Agricultural Research & Veterinary Centre — laboratory/administration building	778
Agricultural Research & Advisory Centre, Tamworth — cereal chemistry laboratory	40,418
Biological & Chemical Research Institute, Rydalmere — Chemistry Diagnostic Service	116,905
Murrumbidgee Agricultural Institute — Short Course Centre	11,500
Purchase of Plant and Equipment — Department of Agriculture	630,399
Total expenditure 1983-84	\$800,000

The 1983-84 allocation from the Consolidated Fund Capital Expenditure Account was increased to \$800,000 from \$500,000 in 1982-83 (which was fully expent).

Special Projects or Services within the Department

Graham Park Breeding Services, Berry

	\$	\$
Income		
Berry produced semen	332,891	
Sale of goods working account	57,946	
Miscellaneous fees	394,381	785,218
Expenditure		
Salaries and payments in the nature of salaries	306,711	
Subsistence and transport expenses	39,330	
Stores	116,337	
General operating expenses	205,087	
Plant and equipment	4,375	
Purchase of motor vehicles	1,077	
Purchase of bulls	24,000	696,917
Surplus		
Add: other income — Sale of Government property		28,529
Net Surplus of Income over Expenditure for 1983-84		\$116,830

As at 30th June 1984, outstanding debtors totalled \$90,788 whilst commitments amounted to \$21,846.

Special Employment Schemes

Employment/Training Programme	Expenditure
Wage Pause Employment Programme (WPEP)	\$2,501,602
Special scheme to promote youth employment and employment generally — State Apprenticeship Scheme (SAS)	133,087
Special Youth Employment Training Programme — State participation (SYETP)	126,199
Special schemes to promote youth employment and employment generally — State Youth Corps (SYC)	182,492
National Employment Strategy for Aborigines (NESA)	291,701
Community Employment Programme (CEP)	1,464,293
Youth Employment Scheme (YES)	611,213
	\$5,310,587

Australian Development Assistance Bureau Working Account

	\$	\$
Balance transferred 1st July 1983		372,372
Receipts during the year — 1983-84		
advances		526,000
miscellaneous projects (unexpended)		10,710
		909,082
Less expenditure		
Salary & allowances	127,957	
Travelling expenses	35,677	
Materials & equipment	251,612	
Other expenses	31,455	
Overhead expenses	60,307	402,008
Balance as at 30th June 1984		\$402,074

All the above expenditure relates to the Sri Lanka — Lower Uva Phase II, Project.

Australian Inoculants Research and Control Service Working Account

	\$	\$
Balance as at 1st July 1983		5,288
Receipts		
Contribution from:		
New South Wales	16,857	
Queensland	7,804	
South Australia	12,487	
Tasmania	1,250	
Victoria	10,926	
Western Australia	13,111	
Industry sources	6,600	69,035
		74,323
Payments		
Salaries	50,474	
Operating expenses	5,584	
Repayment of 1981-82 advance	6,000	62,058
Balance as at 30th June 1984		\$12,265

Cattle Compensation Fund

Diseases covered by the Cattle Compensation Act were brucellosis, tuberculosis, John's disease, tick fever and trichomoniasis.

	\$	\$
Balance as at 1st July 1983		3,531,050
Receipts		
interest	469,929	
levies	164	
stamp duty	116,827	
Commonwealth contributions		
tuberculosis reactors	221,288	
Commonwealth contributions		
brucellosis campaign	217,712	
Commonwealth — special advance	196,000	1,221,920
		4,752,970
Payments		
Compensation		
National brucellosis	268,753	
National tuberculosis	369,460	
Other diseases	4,400	
Other Payments	21,919	
	664,532	
Administration costs of Department of Agriculture	45,434	709,966
Balance in fund at 30th June 1984		\$4,043,004

The above closing balance of \$4,043,004 includes investments currently held with the Treasury of:
\$3,250,000 at 10.67% per annum
\$500,000 at 10.53% per annum

Cattle Compensation Payments 1983-84

	Brucellosis	Johnes Disease	Disease Group Tuberculosis	Other Claims
Number of Claims				
Reg 5	444	7	130	30
Reg 6	—	—	3	—
Total	444	7	133	30
Number of Animals				
Reg 5	1 286	13	1 209	60
Reg 6	—	—	3	—
Total	1 286	13	1 212	60
Payment Details				
Reg 5	\$268,753	\$4,400	\$368,350	\$21,919
Reg 6	—	—	1,110	—
Total	\$268,753	\$4,400	\$369,460	\$21,919

Eradication of Bovine Tuberculosis & Brucellosis — Working Account

	\$	\$
Balance in fund at 1st July 1983		76,415
Income		
Contributions by New South Wales	2,500,000	
Contributions by Commonwealth	5,533,840	
Fees for services rendered	181	
Sale of assets	12,900	
		<u>8,123,336</u>
Expenditure		
Salaries, wages and associated charges	5,836,753	
Travelling expenses	75,620	
Motor vehicle running costs	393,727	
Postage and telephone	169,822	
Freight and cartage	63,257	
Stores and equipment	460,260	
Office requisites and printing	37,549	
Rent and rates	167,749	
Repairs and maintenance	9,771	
Cattle tags	51,578	
Computer running and maintenance	41,312	
Payments to private practitioners for brucellosis sampling	26,804	
T.B. testing	81,298	
Administration costs	178,866	
Purchase of capital plant and equipment	113,801	
Purchase of motor vehicles	41,043	
Land, building and improvements	882	
Other expenses	27,477	
		<u>\$345,766</u>

Against the balance of \$345,767 quoted above must be considered firm commitments of \$140,599 for capital items and \$29,622 for other items. The commitment of \$140,599 for capital items is made up of:

	\$
Replacement motor vehicles	131,470
Plant and machinery	9,129
	<u>\$140,599</u>

The Commonwealth's contribution for 1983-84 was \$2.21 for each \$1 contributed by the State.

Noxious Insects Destruction Account

	\$	\$
Balance as at 1st July 1983		1,208,954
Receipts		
Levies	1,178,446	
Sale of assets	10,655	1,189,101
		<u>2,398,055</u>
Payments		
Travelling expenses	5,717	
Stores, materials	2,252	
Motor vehicle running costs	9,630	
Equipment purchases	305	
Motor vehicle purchases	22,368	
Maintenance and repairs to equipment	2,226	
Salaries and wages	22,918	
Repayment of Treasury Loan	1,000,000	
Contribution to Australian Plague Locust Commission	406,750	
Sundry expenses	465	1,472,631
		<u>Balance as at 30th June 1984</u>
		925,424

During 1983-84 the fund repaid the Treasury \$1,000,000 out of \$1,362,000 from previous year's Treasury loans, leaving a balance of \$362,000 at 30th June 1984.

Swine Compensation Fund

	\$	\$
Balance as at 1st July 1983		1,562,871
Receipts		
Interest		225,614
		<u>1,788,485</u>
Payments		
Compensation	317	
Administration Costs	8,707	
Research Costs	225,801	234,825
		<u>Balance as at 30th June 1984</u>
		1,553,660

The above closing balance includes investments of \$1,550,000 currently held with the Treasury.

Veterinary Surgeons Act, 1923

	\$
Receipts	
Roll Fees	77,139
Registration and Restoration Fees	4,662
Application Fees	—
Complaint Fees	460
Examination Fees	—
	<u>82,261</u>
Payments	
Salaries etc.	52,511
Board fees	3,600
Board members travelling	2,835
Investigating committee — costs	679
Printing	2,662
Legal fees	6,879
Disciplinary tribunal expenses	5,132
Refunds — complaint fees	480
General expenses	2,801
	<u>77,579</u>
Excess of receipts over payments	4,682
	<u>82,261</u>
	<u>86,943</u>

Fund Created by Wheat Marketing (Barring of Claims) Act, 1929

Revenue Account as at 30th June 1984

	\$	\$
Interest from investments and savings bank		9,983.01
Donation from Grain Handling Authority		250.00
		<u>10,233.01</u>
Expenditure		
Commitments entered into during 1983-84	7,887.18	
Bank charges	13.66	
Transfer of unutilised revenue to accumulated funds	2,332.17	
		<u>10,233.01</u>
Balance sheet as at 30th June 1984		
Capital and retained earnings		
Accumulated funds		115,098.42
Total		<u>115,098.42</u>
Represented by Investments —		
Trustee Securities	109,900.00	
	<u>109,900.00</u>	
Current assets:		
Cash	6,564.26	
Accrued Interest	1,724.16	
		<u>8,288.42</u>
Less: Commitments	\$3,090.00	

Tidal Angling Fund

	\$	\$
Balance as at 1st July 1983		9,226
Consolidated Fund Grant 1983-84		182,000
		<u>191,226</u>
Less Expenditure		
Salaries & allowances	109,521	
Travelling expenses	13,198	
Maintenance of motor vehicles and craft	21,602	
Purchase of plant, craft & equipment	24,029	
Fees	3,840	
Fishing clinic expenses	3,459	
Overheads	275	
		<u>175,924</u>
Balance as at 30th June 1984		<u>\$15,302</u>

Commercial Fisheries Exploration and Development Fund

	\$	\$
Balance as at 1st July 1983		17,620
Consolidated Fund Grant 1983-84		2,574,000
Receipts — miscellaneous projects		181,400
Less expenditure		
Salaries and allowance	1,618,882	
Rent & rates	91,472	
Property maintenance	87,976	
Travelling	101,786	
Maintenance of vehicles & launches	271,445	
Printing & advertising	14,374	
Postal & telephone	53,780	
Gas and electricity	55,484	
Fees for services rendered	53,724	
Plant, craft & equipment	314,446	
Other expenses	35,176	
Overheads	11,448	
Capital works	10,926	
		<u>2,720,919</u>
Balance as at 30th June 1984		<u>\$52,101</u>

Inland Fisheries Fund

	\$	\$
Balance as at 1st July 1983		
Receipts		
Consolidated Fund Grant 1983-84	1,207,000	
Licences	810,049	
Sale of vehicles and craft	35,717	
Rents	6,935	
Sale of fish	17,389	
Commonwealth and other grants	53,086	
Miscellaneous	14,301	
		<u>2,144,477</u>

Payments

Salaries and wages	1,043,592	
Payroll tax and workers' compensation insurance	82,711	
Employers' superannuation contribution	106,577	
Maintenance and running costs of motor vehicles & launches	167,834	
Travelling expenses	87,840	
Stores and materials	93,828	
General expenses	35,861	
Fish food	27,108	
Plant and equipment	247,082	
Capital debt charges	10,870	
Postal & telephone	58,247	
Printing, advertising & publicity	1,705	
Gas and electricity	23,038	
Property maintenance	58,119	
Capital works	122,922	
Repayment of advances from Treasury	5,687	
		<u>2,173,021</u>
Balance at 30th June 1984		<u>\$86,275</u>

Statement of Receipts Consolidated Fund Recurrent Receipts Account for the Year Ended 30th June 1984

Receipts for services rendered

	\$
Rents	598,589
Fees — State Acts	
Apiary registrations	44,333
Farm produce agents	37,442
Fertilizers Act	29,240
Registration of pesticides	82,630
Poultry Processing Act	131,965
Stock brands registrations	24,580
Swine brands registrations	33,972
Stock Foods and Medicines Act	192,008
Veterinary Surgeons Act	81,781
Registration of veterinary hospitals	30,774
Broiler growing agreements	13,180
Ovine brucellosis accreditation	25,495
Fisheries and Oyster Farms Act	623,365

Contributions from Commonwealth

Administration of <i>Commerce (Trade Descriptions) Act</i>	707,332
Laboratory on dairy detergents and sanitisers	134,724
Administration of plant quarantine	2,884,822
Administration of animal quarantine	841,261
Export certification of livestock	219,212
Administration of Commonwealth fisheries	273,000
CSIRO for cotton research	58,575
Apprentices' full-time training scheme	27,579

Fees — Services Rendered

Inspections — Plant Diseases Act	128,984
Herd recording	806,938
Seed certification and testing	64,221
Cattle testing	30,245
Miscellaneous receipts for services rendered — dipping	273,940
Administration costs — TB & B eradication	35,586
Campaign working account	321,533
Reimbursement — China projects	177,089
Administration costs — Cattle Compensation Fund	45,434
Administration Costs — Swine Compensation Fund	8,707
Inspections — Meat Industry Act	1,340,392
Collecting commission	35,475
Reimbursement Livestock Market Reporting Service	147,652
Other receipts for services rendered	288,882

Total — receipts for services rendered \$10,800,937

General miscellaneous receipts

	\$
Fines and forfeitures (including bond liabilities)	20,571
Sales and services — Graham Park Breeding Service	727,272
Repayment to credit of previous years vote	1,275,575
Interest	587
Sale of farm produce	922,815
Sale of Government property	110,032
Transfer of part balances of Special Deposits Accounts no longer required	4,444
Employers liability to State Superannuation Fund	838,919
Miscellaneous unclassified receipts	72,771
Pasture Protection Board 3% contribution	2,470
Sale of publications	80,974
Fees — public officers'	3,611
Stamp duty — oyster lease documents	772
On-costs in respect of officers on loan	75,231
Total — miscellaneous receipts	\$4,136,044

Total receipts for the Department of Agriculture, 1983-84 \$14,936,981

Farrer Memorial Research Scholarship Fund Act, 1930

The Farrer Memorial Trust was set up initially to make periodic awards of a scholarship for "study or research in agricultural problems" and later amended to arrange the delivery of an annual Farrer Memorial Oration and presentation of the Farrer Memorial Medal.

The Director-General of the Department of Agriculture New South Wales, Mr G. H. Knowles, is the Chairman of the Trust.

The present scholar, Mr P.R. Schofield, is undertaking his postgraduate studies at the Australian National University, Canberra. His research involves study of the molecular genetics and associated gene functions.

The 1983 Farrer Memorial Medal was awarded to well-known researcher and agricultural scientist, Dr James Robert Syme.

Financial summary for year ended 31st December 1983

	\$
Investments —	71,700
Other current assets	11,470
Income from investments and other assets	9,183
Expenditure	7,574
Excess of income over expenditure	1,609
Donations received and added to the capital Account were:	
Wheat Marketing (Barring of Claims) Fund	2,000
Wheat Industry Research Committee (New South Wales)	4,000
	6,000

A donation of \$1,370 from the NSW Flour Millers' Council was also received to meet part of the Scholarship allowance expenditure.

APPENDIX IV

Committees, Councils, Trusts and Marketing Boards

- Advisory Coordinating Committee,
Department of Environment and Planning
Agricultural Chemicals Committee,
Department of Primary Industry
Agricultural Education Coordination
Committee
Agricultural Remote Sensing Committee
Argentine Ant Eradication Committee
Australian Chicken Meat Research Council
Australian Pesticides Analytical Committee
Australian Seeds Committee
Australian Seeds Industry Advisory
Committee
Australian Society of Animal Production,
Hunter Valley Branch
Australian Soil and Land Resource Committee
Australian United Fresh Fruit and Vegetable
Association
Australian Weeds Committee
Barley Industry Liaison Committee
Basic Seed Cleaning Group
Board Constituted Under Section 30(2) of the
Water Act 1912
C.B. Alexander Agricultural College Advisory
Council
CSIRO Vine Improvement Research
Committee
Central Tobacco Advisory Committee
Certificated Seed Potatoes N.S.W.
Co-operative Ltd.
Chemicals Review Committee (CRSC) to
National Advisory Committee on
Chemicals
Chief Quarantine Officers (Animals)
Committee
Chief Quarantine Officers (Plants) Committee
Citrus Research Committee
Coastal Council of NSW
Combined Industries Committee
Committee of Consultation on Agricultural
Water
Committee to Recommend Safety Directions
and First Aid Statements for Pesticides,
Poison Schedule (Standing) Committee,
National Health and Medical Research
Council.
Commonwealth Livestock Transport
Committee
Commonwealth/NSW Meat Industry
Consultative Committee
Commonwealth/State Meat Consultative
Committee
Composting Use Working Party
Coordinating Committee on Pesticide Residues
in Meat, Australian Meat Research
Council
Course Advisory Committee for the Life
Sciences, New South Wales Institute of
Technology
Deciduous Fruit Tree Improvement
Committee
Departmental Committee on Pesticide
Residues in Animals, Animal Products,
Plants and Plant Products
Determination of Contaminants in Soil,
Standards Association of Australia
Committee
Division of Animal Health — Animal Health
Emergency Committee.
Dried Fruits Research Committee
Eighth Conference of the International
Organization of Citrus Virologists Trust
Committee
Environmental Protection of Areas Affected by
Agricultural Activities Subcommittee of
Technical Advisory Committee, State
Pollution Control Commission
Essential Oils, Standards Association of
Australia Committee
GH Maize Seed Growers Association
Gosford Horticultural Postharvest Research
Laboratory Advisory Committee
Gosford/Wyong Regional Planning Committee
Guayule Research & Development
Co-ordinating Committee
Hawkesbury Agricultural College Agriculture
Course Advisory Group
Hawkesbury and Orange Agricultural Colleges
UG3 Horse Management Advisory
Committee
Herd Improvement Committee
Horticultural Stock & Nurseries Act Advisory
Committee
Inter-Departmental Committee on Uniformity
of Packaging & Labelling Laws
Inter-Departmental Committee on Pesticide
Residues and Economic Poisons
Inter-Departmental Committee on Land
Information
Inter-Departmental Liaison Committee —
Animal Welfare
International Committee for Assessment of
Ruminant Anthelmintics
International Society of Photogrammetry &
Remote Sensing Commission 7

Interstate Citrus Propagation Advisory Committee
 Joint Rural Land Advisory Committee
 Joint Rural Land Liaison Committee
 Laboratory Glassware and Related Apparatus, Standards Association of Australia Committee
 Landscape Committee of National Trust
 MIA IREC Fruit Fly Campaign Committee
 MIA Irrigation Research & Extension Committee (IREC)
 McGarvie Smith Institute
 Meat Industry Authority of NSW
 NSW Dried Fruits Board
 NSW Herbage Plant Liaison Committee
 NSW Horticultural Propagation Co-operative Society Ltd
 NSW Horticulture Export Development Committee
 NSW Plant Import Committee
 NSW Processing Apple & Pear Committee
 NSW Standing Advisory Committee on Wheat
 NSW Tobacco Advisory Committee
 NSW Vegetables Seeds Committee
 National Association of Testing Authorities
 National Co-ordinating Committee on Aquatic Weeds
 National Tree Programme — State Coordinating Committee
 New South Wales Stock Medicines Board
 North West Pesticides Coordinating Committee
 Noxious Plants Advisory Committee
 Oat Industry Advisory Committee
 Open Cut Mining Rehabilitation Subcommittee, State Pollution Control Commission
 Ornamental Horticulture Advisory Committee
 Packing & Handling Committee
 Pastures Protection Board Boundaries Committee
 Pesticides Act Advisory Committee
 Pesticides and Agricultural Chemicals (Standing) Committee of the National Health and Medical Research Council
 Plant Production Committee
 Poisons Advisory Committee — Subcommittee on Pesticides
 Poisons Advisory Committee — Subcommittee on Pesticides — Therapeutic Goods
 Poisons Advisory Committee Non-Therapeutic Subcommittee, Department of Health, New South Wales
 Poultry Farmers Licensing Committee
 Prime Wheat Association Advisory Committee
 Queensland Agricultural College UG3 Courses Assessment Committee
 Regional Wild Pig Advisory Council
 Remote Sensing Association
 SCA — Animal Health Committee — Subcommittee on Animal Welfare
 SCA — Animal Health Committee — Subcommittee on Equine Metritis
 SCA — Animal Health Committee — Subcommittee on Exotic Diseases
 SCA — Animal Health Committee — Subcommittee on Hydatids
 SCA — Animal Health Committee — Subcommittee on Principal Laboratory Officers
 SCA — Animal Health Committee — Subcommittee on Tuberculosis and Brucellosis
 SCA — Animal Health Committee — Subcommittee on Veterinary Public Health
 SCA Horticulture Post Harvest Committee
 Standards Association of Australia Committee CH/5 — Pesticides
 Standards Association of Australia Committee PL/18 — Polythene Pipe in Rural Applications
 Standards Association of Australia Committee on Detergents and Sanitisers
 State Supervising Officers (Exports) Committee
 State Wheat Improvement Committee
 Stock Medicines Board
 Technical Advisory Committee of State Pollution Control Commission
 Technical Committee on Veterinary Drugs
 The Commonwealth Technical Committee on Agricultural Chemicals
 Total Catchment Management Committee
 Uniform Quality Testing Committee (Wheat) University of Sydney Postgraduate Foundation in Veterinary Science
 Use of Reclaimed Water Coordinating Committee — Premier's Department
 Veterinary Surgeons Board
 Veterinary Surgeons Investigating Committee
 Water Management Audit Task Force
 Water Utilisation Council
 Wine Grapes Processing Industry Joint Negotiating Committee

APPENDIX V

Report of the Prickly-Pear Destruction Commission for the Year Ended 30th June 1984

The Commission continued to use integrated control with emphasis on biological control of pear cactii species. The programme of distribution on the prickly-pear insects, *Cactoblastis*, *Cactoblastis cactorum*, and cochineal, *Dactylopius austrinus*, and *D. ceylonicus*, and the use of chemicals, cultivation and other mechanical methods, plus a constant inspection programme, had satisfactory results.

Prickly-Pear Destruction Work

A prickly-pear spray was supplied at cost price, and when purchased to control tiger pear, *Opuntia aurantiaca*, it was supplied at half price. The cost of free control work and free prickly-pear spray supplied during the year to landholders, Government departments and instrumentalities was \$62,532.38.

The control of pest cacti species on all unoccupied Crown Lands continued at a cost of \$12,384.41.

Pest cacti control work costing \$63,143.75 was carried out under contract by the Commission for 91 private landholders. The Commission subsidised part of this work at a cost of \$31,094.92, and some owners were allowed to pay by instalments over a period of years at low interest rates.

Total expenditure by the Commission for the year ended 30th June 1984 was \$1,425,668.28, an increase of \$54,507.74 over 1982-83. Sundry debtors decreased by \$1,503.09. The amount outstanding was \$6,788.62, compared to \$8,291.71 last year.

Prickly-Pear

Leases There were 46 Prickly-pear Leases covering an area of 22 355 hectares as at 30th June 1984, of which 39 (15 949 hectares) were leases in perpetuity.

Community Employment Programme

The Commission had 13 Community Employment Programme employees from January 1984 in the Orana and Far Western Region. The group comprised eight women and five men, and included 10 aborigines. The work programme involved the preparation of sites for prickly-pear insect breeding, distribution of insects, and picking up of plants from recreation areas. The 52 week programme will end in January 1985.

Biological Research

The Commission's biological research programme entered its second phase, involving monitoring field populations of tiger pear. Projects included studies of the distribution and effectiveness of available biological agents, and a comparison of biological and chemical control methods.

Chemical Research

Current research showed that a mixture of trichlophyr and picloram produced results comparable to low volatile 2,4,5-T. Neither product contains the contaminant dioxin. Trial results were encouraging, and further work will be carried out during the coming spring growth period.

G.E. Ryan
COMMISSIONER

Prickly-Pear Destruction Commission Statement of Income and Expenditure at at 30th June 1984

	\$		\$
Balance in fund as at 30th June 1983	864.73	Salaries	253,067.06
Supplementation from Consolidated Revenue	1,185,000.00	Wages	616,956.49
Appropriation	60,000.00	Allowances	13,805.89
Collections	215,938.37	Workers' compensation and payroll tax	77,146.53
		Salary items not subject to payroll tax	—
		Travelling allowances and expenses	82,544.25
		Maintenance of motor vehicles and caravans	120,591.86
		Purchase of motor vehicles and caravans	115,402.49
		Purchase of stock, plant and minor equipment	102,807.86
		Rents, rates, freight and cartage	11,805.46
		Buildings, improvements and insurance	23,923.53
		Postal and telephone charges	7,615.96
		Balance unexpended as at 30th June 1984	36,134.82
	\$1,461,803.10		\$1,461,803.10

APPENDIX VI

Agricultural College Courses and Student Statistics

Student Statistics

Murrumbidgee College of Agriculture

Enrolments 1984	Male	Female	Total
Certificate in Agriculture	54	6	60
Advanced			
Certificates:			
Agriculture	12	2	14
Rangeland			
Management	1	1	2
Irrigation	10	—	10
	77	9	86
Certificates gained 1983			
Certificate in Agriculture	49	4	53
Advanced			
Certificates:			
Agriculture	3	4	7
Rangeland			
Management	2	—	2
Irrigation	3	—	3
	57	8	65

C.B. Alexander Agricultural College

Enrolments 1984	Male	Female	Total
Certificate in Agriculture	58	22	80
Advanced			
Certificate in Agriculture	37	12	49
Dairy			
Apprenticeship			
Course	19	2	21
Correspondence			
Courses Production			
Unit			
Farm Management	324	78	402
Farm Office			
Management	62	138	200
Certificates gained 1983			
Certificate in Agriculture	53	14	67
Advanced			
Certificate in Agriculture	26	12	38
Certificate in Dairying	—	—	—

Short Courses

C.B. Alexander Agricultural College

Course	No. of Courses	No. of Students
Veterinary officers conference	1	45
Livestock officers (beef cattle) conference	1	41
Agriculture field day	1	220
Compudose field day	1	30
Dairy nutrition seminar	1	60
Angus breeders school	1	35
Land use planning seminar	1	40
Agriculture schools	2	50
WEA summer school	1	96
Total summer school	1	54
Total small farms field days	1	7000
Horticulture advisory officers conference	1	41

Murrumbidgee College of Agriculture

Course	No. of courses	No. of students
Meat Inspectors courses	4	44
Landforming for irrigation	4	62
Haymaking course	1	40
Farm Management	4	56
Office Support Staff workshop	1	35
Computers in agriculture	1	13
Tractor driving school	1	10
Irrigation course for agronomists	1	12
Rural Youth farm safety camp	1	20
Farm Office Management	2	20
W.R.C. in-service courses	3	46
Fruit fly conference	1	36
Dairy nutrition school	1	18
Agricultural Inspectors conference	1	10
A.D.A.B. course	1	18
Vegetable symposium	1	14
Horticulture workshop	1	45
Lions Club — youth camp	1	26
Tractor maintenance school	1	35
Sheep and wool seminar	2	98
Agonomists workshop	1	25
Salinity workshop	1	57
Clerical staff workshop	1	10
I.R.E.C. weeds workshop	1	50
Fisheries conference	1	12
Australian Soil Science Society conference	1	15
Rice liaison meeting	1	14



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